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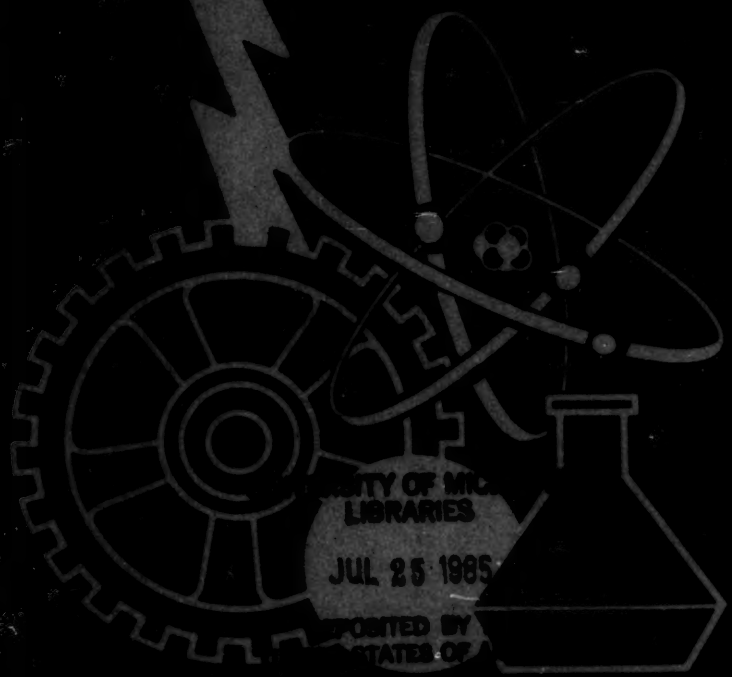

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June 25, 1985 Volume 1055 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1055 OG 26
Notice of Maintenance Fees Payable	1055 OG 26
Reissue Applications Filed	1055 OG 26
Requests for Reexaminations Filed	1055 OG 27
Notice by Publication	1055 OG 27
Registration Numbers Omitted	1055 OG 28
Errata	1055 OG 28
Status of PTO Services	1055 OG 29
Patent Certificates of Correction	1055 OG 31
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1055 OG 32
Condition of Patent Applications	1055 OG 33
Reexaminations	1379
Reissue Patents Granted (31,920)	1381
Plant Patents Granted (5,498)	1387
Patents Granted	
General and Mechanical (4,524,463)	1389
Chemical (4,525,168)	1635
Electrical (4,525,593)	1755
Design Patents Granted (279,325)	1855
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 52
Classification of	
Patents (Including Reissues and Reexaminations)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 62
Change of Address Form and Subscription Order Form	Back Page

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 7, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 22, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,335,471 through 4,336,616

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,702,519, Re. S.N. 714,984, Filed Mar. 22, 1985, Cl. 051/310, METHOD FOR THE REMOVAL OF UNWANTED PORTIONS OF AN ARTICLE BY SPRAYING WITH HIGH VELOCITY DRY ICE PARTICLES, Edwin E. Rice, et al., Owner of Record: *Charles H. Franklin, Clarence S. Vinton, et al., Ann Arbor, Mich.*, Attorney or Agent: Ian C. McCleod, Ex. Gp.: 323

4,065,664, Re. S.N. 731,777, Filed May 8, 1985, Cl. 364/487, FLOATING POINT REGISTERS FOR PROGRAMMED DIGITAL INSTRUMENTS, Paul J. Kristof, et al., Owner of Record: *Norland Corp., Fort Atkinson, Wis.*, Attorney or Agent: Henry W. Collins, et al., Ex. Gp.: 234

4,072,851, Re. S.N. 731,874, Filed May 8, 1985, Cl. 364/487, WAVEFORM MEASURING INSTRUMENT WITH RESIDENT PROGRAMMED PROCESSOR FOR CONTROLLED WAVEFORM DISPLAY AND WAVEFORM DATA REDUCTION AND CALCULATION, Frederick A. Rose, Owner of Record: *Norland Corp., Fort Atkinson, Wis.,* Attorney or Agent: Henry W Collins, et al., Ex. Gp.: 234

4,134,149, Re. S.N. 731,914, Filed May 8, 1985, Cl. 364/900, HIGH SWEEP RATE WAVEFORM DISPLAY CONTROL FOR DIGITAL RECORDING WAVEFORM DEVICES, Russell H. Nord, Owner of Record: *Norland Corp., Fort Atkinson, Wis.,* Attorney or Agent: Henry W. Collins, et al., Ex. Gp.: 237

4,234,620, Re. S.N. 732,088, Filed May 9, 1985, Cl. 426/656, WATER-SOLUBLE VEGETABLE PROTEIN AGGREGATES, Paulette A. Howard, et al., Owner of Record: *A. E. Staley Manufacturing Co., Decatur, Ill.,* Attorney or Agent: Forrest L. Collins, et al., Ex. Gp.: 132

4,381,013, Re. S.N. 723,698, Filed Apr. 16, 1985, Cl. 128/785, "J" STYLET WIRE, Robert G. Dutcher, Owner of Record: *Medtronic, Inc., Minneapolis, Minn.,* Attorney or Agent: Reed A. Duthler, Ex. Gp.: 335

4,383,219, Re. S.N. 732,079, Filed May 9, 1985, Cl. 324/309, NUCLEAR MAGNETIC RESONANCE SPATIAL MAPPING, Jerome I. Kaplan, Owner of Record: *Indiana University Foundation, Bloomington, Ind.,* Attorney or Agent: Daniel W. Vittum, Jr., et al., Ex. Gp.: 267

4,416,330, Re. S.N. 724,471, Filed Apr. 17, 1985, Cl. 228/173.4, SIDE POCKET MANDREL, David T. Merritt, et al., Owner of Record: *Otis Engineering Corp., Carrollton, Tex.,* Attorney or Agent: Albert W. Carroll, Ex. Gp.: 355

4,461,342, Re. S.N. 733,752, Filed May 13, 1985, Cl. 165/104.32, METHOD AND APPARATUS FOR AUTOMATICALLY REFILLING A LEAKING LIQUID COOLING SYSTEM AS AN ENGINE OPERATES BY UTILIZING A RADIATOR AND A REMOTE COOLANT RESERVOIR, Walter C. Avrea, Owner of Record: *Inventor,* Attorney or Agent: Don J. Flickinger, et al., Ex. Gp.: 346

4,471,770, Re. S.N. 724,291, Filed Apr. 17, 1985, Cl. 128/132R, PROTECTIVE COVER FOR HUMAN LIMB JOINTS, Susan Pompa, Owner of Record: *S. J. Kaplan and Associates, Inc., Lincolnwood, Ill.,* Attorney or Agent: Paul H. Gallagher, Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,399,545, Reexam. No. 90/000,786, Requested: May 20, 1985, Cl. 62/237, APPARATUS FOR CONNECTING A STATIONARY AIR-CONDITIONING UNIT TO AIRCRAFT, Gordon K. Anderson, et al., Owner of Record: *Lear Siegler, Inc., Santa Monica, Calif.,* Attorney or Agent: Christie, Parker, et al., Ex. Gp.: 344, Requester: Lear Siegler, Inc., Santa Monica, Calif.

3,631,434, Reexam. No. 90/000,785, Requested: May 17, 1985, Cl. 340/568, PASSIVE INTRUSION DETECTOR, Frank Schwartz, Owner of Record: *Barnes Engineering Co., Stamford, Conn.,* Attorney or Agent: Brumbaugh, Graves, et al., Ex. Gp.: 260, Requester: Owner

4,084,381, Reexam. No. 90/000,783, Requested: May 20, 1985, Cl. 61/36, STABILIZATION OF EARTH SUBSURFACE LAYERS, Gene Cain, et al., Owner of Record: *Woodbine Corp., Fort Worth, Tex.,* Attorney or Agent: Wofford, Fails, et al., Ex. Gp.: 350, Requester: Holland Soil Stabilizers, Inc., Houston, Tex.

4,233,015, Reexam. No. 90/000,784, Requested: May 20, 1985, Cl. 405/263, EMPLOYING QUICKLIME IN STABILIZING EARTH, Joe D. Teague, et al., Owner of Record: *Woodbine Corp., Fort Worth, Tex.,* Attorney or Agent: William T. Wofford, Ex. Gp.: 351, Requester: Holland Soil Stabilizers, Inc., Houston, Tex.

4,288,929, Reexam. No. 90/000,781, Requested: May 14, 1985, Cl. 36/69, MOTION CONTROL DEVICE FOR ATHLETIC SHOE, Edward J. Norton, et al., Owner of Record: *New Balance Athletic Shoe, Inc., Lawrence, Mass.,* Attorney or Agent: Samuel B. Smith, Ex. Gp.: 350, Requester: Owner

4,381,379, Reexam. No. 90/000,790 Requested: May 28, 1985, Cl. 525/424, POLYESTER CONTAINING 2-METHYL-1,3-PROPYLENE TEREPHTHALATE UNITS, Yuzo Toga, et al., Owner of Record: *Daicel Chemical Industries, Ltd., Sakai-Shi, Osaka, Japan,* Attorney or Agent: L. Martin Flynn, Ex. Gp.: 151, Requester: Owner

4,405,881, Reexam. No. 90/000,788, Requested: May 24, 1985, Cl. 313/480, COLOR CATHODE RAY TUBE INCLUDING DN_2O_3 AND CR_2O_3 IN FACE GLASS, Hiroo Kobayashi, Owner of Record: *Mitsubishi Denki Kabushiki Kaisha,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 266 Requester: Owner

4,481,555, Reexam. No. 90/000,782, Requested: May 20, 1985, Cl. 361/155, ELECTROMAGNETIC CONTACT DEVICE, Masayuki Yoshida, et al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 214, Requester: Owner

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United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

Joseph F. Nakamura,

Solicitor, U.S. Patent and Trademark Office,

v.

Proceeding No. 84-2
Horace S. Harper, Jr.,
Respondent.

Notice by Publication

Notice is hereby given to the above named respondent, that proceedings under 35 U.S.C. §32 have been instituted against him. A copy of the *NOTICE OF PROCEEDINGS UNDER 35 U.S.C. §32,* including the charges against respondent, was twice mailed to the respondent's address of record. The notice was twice returned by the U.S. Postal Service.

Respondent may obtain of copy of the above-mentioned notice from:

Richard E. Schafer
Associate Solicitor
U.S. Patent and Trademark Office
P.O. Box 15667
Arlington, Va. 22215
(703) 557-4035

This notice will appear in the Official Gazette for four consecutive weeks beginning with the issue of June 11,

1985. Respondent has thirty days from the date of the last notice to file an answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR §1.348 (c).

JOSEPH F. NAKAMURA,
Solicitor

By: RICHARD E. SCHAFER
Associate Solicitor.

Registration Numbers Omitted

The following registration numbers, were omitted from the sequential assignment of numbers and, thus, did not appear in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 2, 1985.

1,328,515	TM 204	Apr. 2, 1985
1,328,516	TM 204	Apr. 2, 1985

No certificates of registration bearing the above-identified numbers were issued on the date indicated.

PATRICIA M. DAVIS,
May 13, 1985. *Administrator for Trademark Operations.*

Erratum

In the "Trademark Registrations Renewed" section of the Trademark Official Gazette of Aug. 7, 1984, the mark for Registration No. 182,585 was incorrectly identified as LE NAZCISE NOIR AND DESIGN. The mark as corrected is LE NARCISSE NOIR AND DESIGN.

PATRICIA M. DAVIS,
May 17, 1985. *Administrator for Trademark Operations.*

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 2, 1985, were listed inadvertently:

1,327,912	TM 192	Apr. 2, 1985
1,327,999	TM 193	Apr. 2, 1985
1,328,545	TM 204	Apr. 2, 1985
1,328,675	TM 207	Apr. 2, 1985
1,328,697	TM 208	Apr. 2, 1985
1,328,700	TM 208	Apr. 2, 1985
1,328,746	TM 209	Apr. 2, 1985
1,328,967	TM 214	Apr. 2, 1985
1,329,122	TM 223	Apr. 2, 1985

Consequently, the certificates of registration bearing the above-identified numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
May 13, 1985. *Administrator for Trademark Operations.*

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 9, 1985, were listed inadvertently:

1,329,578	TM 427	Apr. 9, 1985
1,329,585	TM 427	Apr. 9, 1985

Consequently, the certificates of registration bearing the above-identified numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
May 17, 1985. *Administrator for Trademark Operations.*

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 23, 1985, were listed inadvertently:

1,331,578	TM 863	Apr. 23, 1985
1,332,133	TM 874	Apr. 23, 1985
1,332,157	TM 874	Apr. 23, 1985
1,332,463	TM 881	Apr. 23, 1985
1,332,487	TM 881	Apr. 23, 1985

Consequently, the certificates of registration bearing the above-identified numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
May 17, 1985. *Administrator for Trademark Operations.*

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 30, 1985, were listed inadvertently:

1,332,785	TM 1082	Apr. 30, 1985
1,332,786	TM 1082	Apr. 30, 1985
1,332,787	TM 1082	Apr. 30, 1985
1,332,792	TM 1083	Apr. 30, 1985
1,332,794	TM 1083	Apr. 30, 1985
1,332,806	TM 1083	Apr. 30, 1985
1,332,820	TM 1083	Apr. 30, 1985
1,332,969	TM 1086	Apr. 30, 1985
1,333,013	TM 1088	Apr. 30, 1985
1,333,057	TM 1088	Apr. 30, 1985
1,333,065	TM 1088	Apr. 30, 1985
1,333,137	TM 1090	Apr. 30, 1985
1,333,138	TM 1090	Apr. 30, 1985
1,333,145	TM 1090	Apr. 30, 1985
1,333,304	TM 1093	Apr. 30, 1985
1,333,335	TM 1094	Apr. 30, 1985
1,333,345	TM 1094	Apr. 30, 1985
1,333,455	TM 1097	Apr. 30, 1985
1,333,457	TM 1097	Apr. 30, 1985
1,333,458	TM 1097	Apr. 30, 1985
1,333,459	TM 1097	Apr. 30, 1985
1,333,461	TM 1097	Apr. 30, 1985
1,333,495	TM 1097	Apr. 30, 1985
1,333,499	TM 1098	Apr. 30, 1985
1,333,500	TM 1098	Apr. 30, 1985
1,333,509	TM 1098	Apr. 30, 1985
1,333,510	TM 1098	Apr. 30, 1985
1,333,573	TM 1099	Apr. 30, 1985
1,333,673	TM 1102	Apr. 30, 1985
1,333,675	TM 1102	Apr. 30, 1985
1,333,684	TM 1102	Apr. 30, 1985
1,333,693	TM 1102	Apr. 30, 1985
1,333,871	TM 1113	Apr. 30, 1985

Consequently, the certificates of registration bearing the above-identified numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
May 17, 1985. *Administrator for Trademark Operations.*

Status of PTO Services

The following is an update of the status of PTO services for May 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	25	Reduced by 8 days since last month.
Trademarks	30	34	Tapes received late from contractor.
Patent/Trademark Copies:			
Window Coupons	5	97% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		May 10, 1985	
Current Mail Date being processed		May 23, 1985	
Certified Copies:			
Trademark Registrations	30	30	
Applications-As-Filed	20	99% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	98% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	20	Reduced 7 days since last month.
Filing Reg. Certificates	3	8	
Assignments:			
Patents	25	15	
Trademarks	25	15	
Avg. Days from Issue Fee Payment to Issue Date	90–100	87	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	3 days late	
Patent Copies Available	Issue Date	91% on Issue Date	
Trademark Copies Available	Issue Date	99% on Issue Date	

*Figures include postal processing and delivery time.

HELPFUL HINTS FROM THE PTO

- In the May 28, 1985, Official Gazette "HELPFUL HINTS FROM THE PTO", conflicting direction was given on marking initial or substitute file drawings:

  — *Application File Drawings* —Application Branch personnel are having some difficulty matching drawings with applications during pre-examination processing. It would be helpful if the applicant's name, docket number, and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels.

  — When the Office receives formal or substitute drawings, a cover letter identifying the application by serial number should accompany them. It is extremely difficult to associate the drawings with the files when this information is missing. The application serial number should be placed on the sheet of drawing in accordance with 37 CFR 1.84 (l).

  According to 37 CFR 1.84 (l), identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2¾ inches may be placed in a centered location between the side edges within three-fourths inch of the top edge. Either this marking technique on the front of the drawing or the

placement of this information on the back of the drawing is acceptable. However, for identification of the serial number, the PTO prefers that it be placed on the front.

- *Patent Applications* — We are trying to expedite and improve preliminary processing of patent applications. Please help by putting patent applications and associated papers (e.g. assignments) in a separate envelope from all other mail. Identify on the outside of the envelope "PATENT APPLICATIONS". For example, if you are submitting two patent applications with associated assignment papers, they would all be placed in an envelope marked "PATENT APPLICATIONS". Any other papers being submitted, such as amendments to other applications, appeals, and patent copy requests, would be placed in another envelope.

- *File Wrapper Continuation Applications* — Many continuation applications filed under 37 CFR 1.62 (FWC) contain no preliminary amendment to the claims which were finally rejected in the parent application. The result is a first action final rejection of these claims. Applicants should file any desired amendments at the time the application is filed under 37 CFR 1.62, since the Office is treating these applications as "Special" and an action on the merits will be rendered quite promptly.

- *Surcharge for Filing a Patent Application* — Filing dates are accorded to applications filed without the basic filing fee and without the oath or declaration. In such cases, a notice is mailed by Application Division requiring at least the basic filing fee and the oath or declaration, accompanied by a surcharge (37 CFR 1.16(E)). In numerous instances, applicants fail to submit the surcharge causing the application to become abandoned. See 37 CFR 1.53(D) and MPEP §506.

  Small Entity Statements — Verified statements claiming small entity status, where appropriate, would best be signed and submitted at the time the application oath or declaration is signed to permit filing of the statement with the applications. This would reduce correspondence between attorney and client, reduce paper handling by the PTO support staff and the PTO Finance Branch, and greatly simplify the processing of subsequent papers involving fees. If small entity status is being claimed for the first time at the time of payment, a verified statement claiming small entity status should be submitted with the issue fee. See MPEP §509.03.

June 3, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of June 25, 1985

D. 275,733	4,458,198	4,478,392	4,492,798
D. 277,088	4,459,395	4,478,409	4,493,020
D. 277,527	4,460,687	4,478,422	4,493,203
3,702,833	4,461,028	4,478,438	4,493,421
4,214,899	4,461,759	4,478,662	4,493,977
4,253,076	4,461,828	4,478,967	4,494,105
4,264,782	4,463,054	4,479,226	4,494,607
4,301,560	4,463,270	4,479,432	4,494,671
4,313,758	4,464,178	4,479,617	4,494,703
4,323,068	4,464,802	4,479,756	4,494,851
4,327,730	4,464,814	4,481,609	4,495,308
4,348,654	4,465,746	4,482,556	4,495,393
4,349,409	4,470,669	4,482,581	4,495,823
4,371,647	4,470,714	4,482,616	4,496,569
4,381,335	4,473,077	4,485,147	4,496,690
4,386,970	4,473,085	4,485,585	4,497,119
4,393,158	4,473,951	4,485,689	4,497,454
4,400,188	4,475,173	4,485,711	4,497,572
4,409,550	4,475,392	4,485,911	4,497,706
4,410,368	4,476,214	4,486,128	4,497,725
4,413,233	4,476,642	4,486,198	4,497,862
4,418,098	4,476,678	4,486,313	4,498,275
4,421,057	4,476,764	4,486,377	4,498,845
4,427,660	4,476,798	4,486,574	4,498,962
4,427,714	4,476,808	4,486,616	4,500,232
4,431,664	4,476,813	4,486,641	4,500,417
4,433,674	4,476,820	4,486,858	4,500,561
4,434,244	4,476,879	4,487,436	4,500,961
4,434,654	4,476,996	4,488,268	4,501,136
4,438,257	4,477,138	4,488,701	4,501,152
4,441,108	4,477,145	4,489,177	4,501,464
4,446,018	4,477,297	4,489,342	4,501,515
4,446,086	4,477,510	4,489,570	4,501,982
4,447,521	4,477,514	4,489,664	4,502,463
4,447,711	4,477,556	4,489,786	4,502,468
4,449,943	4,477,572	4,490,918	4,502,725
4,450,284	4,477,583	4,491,036	4,502,814
4,450,488	4,477,590	4,491,100	4,502,891
4,454,357	4,477,606	4,491,179	4,503,678
4,455,427	4,477,679	4,491,922	4,503,899
4,455,625	4,477,774	4,492,233	4,504,098
4,457,161	4,477,782	4,492,673	4,504,500
4,457,987	4,477,930	4,492,759	

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The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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	Sacramento: California State Library	(916) 322-4572
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	Miami–Dade Public Library	(305) 579-5001
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 11, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-08-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-05-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-23-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-03-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-26-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-17-83

Expiration of patents: The patents within the range of numbers indicated below expire during May 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,381,303 to 3,386,102, inclusive

Plant Patents . . . . . Numbers 2,811 to 2,813 inclusive

REEXAMINATIONS

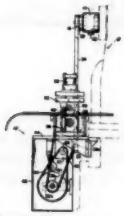
JUNE 25, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 29,795 (360th)
SELF-CONTAINED FEED ROLL FOR POWER PUNCH PRESSES

Harry Eyberger, Pittsburgh, Pa., assignor to Vamco Machine and Tool, Inc., Pittsburgh, Pa.

Reexamination Request No. 90/000,192, Apr. 27, 1982.
Reexamination Certificate for Reissue Patent Re. 29,795, issued Oct. 10, 1978, Ser. No. 861,190, Dec. 16, 1977.
Original No. 3,483,782, dated Dec. 16, 1969, Ser. No. 651,295, Jul. 5, 1967.
Int. Cl.³ B26D *5/20*
U.S. Cl. 83—245



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–9** are cancelled.

[**1**. A self-contained feed roll unit for a power punch press having a crankshaft rotating in timed relation to the pressing portion of the operating cycle of said punch press, said feed roll unit comprising:

(a) a power driven feed roll;

(b) an idler feed roll rotatably supported on a movable frame and normally urged toward said power driven feed roll, said idler feed roll being periodically moved away from said power driven feed roll by feed roll release means to free stock being fed to said power pass during the pressing portion of said power press operating cycle;

(c) an index drive having an input shaft to receive continuous, uniform rotary motion and an output shaft transmitting non-continuous, incremental rotary motion;

(d) first positive drive means drivingly connecting said index drive input shaft to said power press crankshaft; and

(e) second positive drive means including a first drive member connected to said index drive output shaft, a driven member connected to said power driven feed roll, an idler member drivingly connected to said first drive member and said driven member to thereby drivingly connect said index drive output shaft to said power driven feed roll, said second positive drive means being adjustable to vary the ratio of the angular velocity of said index drive output shaft relative to said power driven roll.]

B1 3,742,723 (361st)
PIPE FREEZING DEVICE

Frederick G. J. Grisé , Box 12, West Brookfield, Mass. 01506

Reexamination Request No. 90/000,398, Jun. 8, 1983.
Reexamination Certificate for Patent No. 3,742,723, issued Jul. 3, 1973, Ser. No. 195,980, Nov. 5, 1971.
Int. Cl.³ F25D *3/00*
U.S. Cl. 62—293

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **5** and **8** are determined to be patentable as amended.

Claims **2–4**, **6**, **7** and **9**, dependent on an amended claim, are determined to be patentable.

1. A pipe freezing device comprising an annular chamber having an outer circumferential wall and side walls thereon, and an open inside aspect, means removably securing the chamber about the pipe to be frozen, with the open inside aspect of the chamber contiguous with respect to the pipe and the side walls closely embracing the pipe, *the annular chamber being open adjacent the outer wall in both circumferential directions over the entire length of the outer wall,*

a source of gas-forming liquid under pressure, a tube adapted to connect the source to a wall of the chamber, and a vent in the chamber for the gas, said vent being remote from the tube so that the gas-forming liquid and gas formed therefrom extend about the pipe to be frozen, the gas escaping freely to the atmosphere through the vent.

REISSUES

JUNE 25, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,920
FISHING REEL HAVING SUPPORT FOR A DEFLECTED SPOOL SHAFT

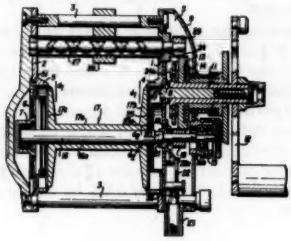
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Original No. 4,232,842, dated Nov. 11, 1980, Ser. No. 19,144, Mar. 9, 1979. Application for reissue Nov. 5, 1982, Ser. No. 439,592

Claims priority, application Japan, Mar. 14, 1978, 54-33064

Int. Cl.³ A01K *89/015*

U.S. Cl. 242—212 **14 Claims**



7. A fishing reel comprising:

(a) first and second opposed side plates, each of said side plates having an annular frame extending axially inwardly and being connected by a plurality of connecting rods to the other side plate;

(b) a gear cover fixed at the outside of the first side plate of said pair, said gear cover and first side plate having a space therebetween;

(c) a handle shaft rotatably supported between said first side plate and said gear cover, said handle shaft projecting outwardly of said gear cover and carrying a handle bar at the projecting end of said handle shaft;

(d) a master gear supported to said handle shaft, said master gear being arranged within said space;

(e) a spool shaft journaled at respective opposite ends to a first bearing supported adjacent said second side plate and a second bearing supported by said gear cover, said spool shaft having a first engaging portion;

(f) a spool fixed to said spool shaft, said spool comprising a trunk and a pair of flanges which extend from both axial ends of said trunk radially outwardly thereof, said flanges having slightly smaller outer diameters than the inner diameters of said annular frames, the outer periphery of said flanges opposing the inner peripheries of said annular frames;

(g) a pinion supported to said spool shaft to be axially slidable therealong said pinion being arranged within said space, meshed with said master gear, and provided at one axial end with a second engaging portion engageable with said first engaging portion of said spool shaft;

(h) control means for controlling the sliding motion of said pinion; and,

(i) support means provided at said first side plate and having a support portion for supporting said spool shaft at a substantially intermediate portion thereof, said support portion of said support means being adapted to be normally free from said spool shaft but to support said spool shaft by contact therewith when said spool shaft deflects a predetermined amount.

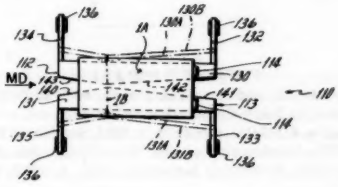
Re. 31,921
METHODS AND APPARATUS FOR STACKING CEMENTITIOUS REINFORCED PANELS

Theodore E. Clear, 429 S. Washington Blvd., Hamilton, Ohio 45013, and Robert Miller, 6318 Osage Rd., Fairfield, Ohio 45015

Original No. 4,281,952, dated Aug. 4, 1981, Ser. No. 78,932, Sep. 26, 1979. Division of Ser. No. 887,324, Mar. 16, 1978, Pat. No. 4,203,788. Application for reissue May 19, 1982, Ser. No. 379,633

Int. Cl.³ B65G *57/00*

U.S. Cl. 414—82 **5 Claims**



1. A method of stacking flexible assemblies, each comprising an uncured cementitious panel carried on a carrier sheet, one atop another, comprising the steps of:

conveying an assembly onto a drop table, said drop table comprising a plurality of drop panels supporting said carrier sheet and withdrawable therefrom to drop said assembly onto a stack of assemblies, said drop plates having tapered edges beneath said carrier sheets;

withdrawing support from said carrier sheet, first from corners thereof and then from central portions thereof, to drop said assembly, all by sliding said drop plates horizontally from beneath said carrier sheet.

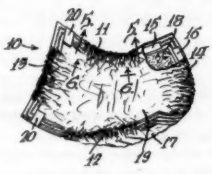
Re. 31,922
CONFORMABLE DISPOSABLE DIAPERS HAVING ABSORBENT PANEL WITH BULGED SIDE MEMBERS

Frederick K. Mesek, and Virginia R. Mesek, both of San Diego, Calif., assignors to Johnson & Johnson, New Brunswick, N.J.

Original No. 4,324,245, dated Apr. 13, 1982, Ser. No. 106,182, Dec. 21, 1979. Continuation of Ser. No. 862,309, Dec. 20, 1977, abandoned. Application for reissue Sep. 23, 1983, Ser. No. 535,088

Int. Cl.³ A41B *13/02*

U.S. Cl. 604—385 A **34 Claims**



24. A disposable diaper comprising: a first outer layer in the form of a moisture-impervious backing; an absorbent batt positioned in superposed relationship with respect to said backing, said batt being smaller than said backing and spaced inwardly from the sides and ends thereof; a second outer layer in the form of a moisture-pervious facing positioned in superposed relationship with

respect to said batt, said facing being larger than said batt and being substantially coterminous with said backing; side margins and end margins provided by the space between the edge of said batt and the edge of said diaper; an elastic member in each side margin of the diaper; means securing each elastic member to at least one of said outer layers to effect gathering in the side margins of the diaper when the elastic members are relaxed; and gasketing means provided by each elastic member being positioned sufficiently close to one side of the batt to at least in part effect gasketing action by the side of the batt and to produce controlled pillows at the side of the batt while the central region of the outer layers and the batt remains generally smooth and ungathered thus forming a bowl-like configuration, said pillows consisting of bulges formed in said moisture-pervious facing by the interaction of said elastic member with said moisture-impervious backing and with said moisture-pervious facing, each elastic member being at least about ¼ inch in width and having a recovery force sufficient to overcome the resistance to deformation offered by the absorbent batt.

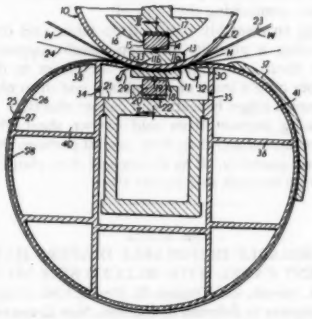
Re. 31,923
EXTENDED NIP PRESS

Edgar J. Justus, and Arnold J. Roerig, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Original No. 4,287,021, dated Sep. 1, 1981, Ser. No. 69,869, Aug. 27, 1979. Continuation of Ser. No. 403,122, Jul. 29, 1982, abandoned. Application for reissue Aug. 1, 1983, Ser. No. 519,369

Int. Cl.³ D21F *3/06, 3/08*

U.S. Cl. 162—358 **8 Claims**



1. An extended nip press for removing water from a traveling web in a paper machine comprising in combination:

a press roll;

an elongate shoe forming a press nip with said press roll and having a concave surface to conform to said roll so that the press nip is formed elongate in the direction of web travel through the nip;

[a first endless felt trained over said roll to travel through said nip;]

an endless belt trained over said shoe for passing through said nip;

[a second endless felt trained over said belt to travel through said nip with the web passing through the nip between said felts;]

means for receiving water pressed from the web in said press nip;

means for providing a lubricant between said shoe and belt;

and guide means within said belt guiding and supporting the belt on the shoe;

said guide means having an outer smooth curved surface of a circumference slightly smaller than the belt to provide a continual smooth sliding surface for the belt so that the belt [operates under zero tension and] is self-aligning wherein the belt is guided [substantially] along *substantially* the entire circumference of the guide means.

Re. 31,924
COMPOSITION AND METHOD FOR STIMULATION OF BACTERIA

Jerry Starr, deceased, late of Holtville, Calif. (by Walter C. Williams, administrator), assignor to Biohumus, Inc., Holtville, Calif.

Original No. 4,321,142, dated Mar. 23, 1982, Ser. No. 184,401, Sep. 15, 1980. Continuation-in-part of Ser. No. 86,934, Oct. 22, 1979, Pat. No. 4,246,100. Application for reissue Mar. 21, 1984, Ser. No. 592,393

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ C02F *3/00*

U.S. Cl. 210—610 **7 Claims**

1. A composition for addition to sewage or soil to stimulate the growth of [aerobic] bacteria comprising the product of combining (1) the liquid product of a first digestion of milch cow excrement under mild acid conditions and further digestion of liquid portions from the first digestion by the action of algae and solar radiation, (2) at least 0.02% by weight of each of thiamine, riboflavin and niacin based on the weight of said liquid digestion product to activate a[n aerobic] bacteria-stimulating action and (3) at least 0.4% by weight of magnesium chloride.

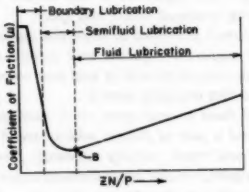
Re. 31,925
PROCESS FOR COMPRESSION ROLLING OF POLYMERIC FILMS

Richard H. Jenks, Saquoit, N.Y., and Egbert M. Kipp, Devon, Pa., assignors to Revere Copper and Brass Incorporated, New York, N.Y.

Original No. 4,085,187, dated Apr. 18, 1978, Ser. No. 684,970, May 10, 1976. Continuation of Ser. No. 140,656, Apr. 15, 1980, abandoned. Application for reissue Jan. 26, 1983, Ser. No. 461,169

Int. Cl.³ B29C *15/00*

U.S. Cl. 264—280 **10 Claims**



9. A process for compression rolling of thermoplastic sheet material comprising:

a. passing the material between cylindrical rollers with a semi-boundary lubricant applied to the surfaces of the material to establish and maintain frictional contact between surfaces;

b. adjusting the circumferential speed of the rollers and the pressure between the rollers to achieve and maintain a semi-boundary lubrication condition and to effect a reduction in the original thickness of the material of between about 5 and 95 percent in a single pass;

c. maintaining the circumferential speed of the roller in step a. essentially equal to the linear speed of the thermoplastic sheet material passsing between said rollers; and

d. maintaining the film rewind tension so as not to exceed the elastic limit of the material exiting from the rollers.

Re. 31,926

PENICILLINS AND SALTS THEREOF

Bernd Wetzel, Biberach an der Riss; Wolfgang Reuter, Laupertshausen; Eberhard Woitun; Roland Maier, both of Biberach an der Riss; Uwe Lechner, Ummendorf; Hanns Goeth, and Rolf Werner, both of Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

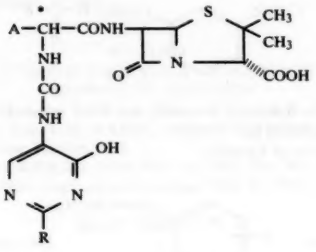
Original No. 4,241,056, dated Dec. 23, 1980, Ser. No. 13,006, Feb. 21, 1979. Application for reissue Sep. 21, 1982, Ser. No. 420,804

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808153; Nov. 27, 1978, 2851226; Nov. 27, 1978, 2851270

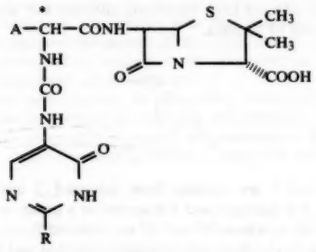
Int. Cl.³ A61K *31/655, 31/43;* C07D *499/68, 499/70*

U.S. Cl. 514—157 8 Claims

1. A compound of the tautomeric formulas

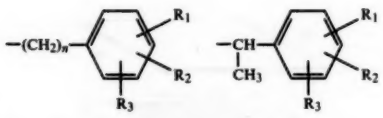


and

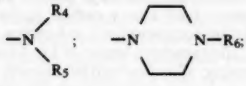


wherein A is phenyl; 4-hydroxyphenyl; 2-thienyl; 3-thienyl; cyclohexyl; cyclohexen-1-yl; cyclohexa-1,4-dien-1-yl; phenyl disubstituted in 3,4-position, where the substituents are each chlorine, hydroxyl or methoxy;

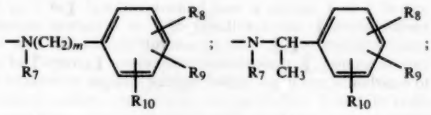
R is hydrogen; aliphatic hydrocarbyl of 1 to 8 carbon atoms optionally containing one to two double bonds or a triple bond; cyclopropyl, which may optionally be substituted with one to two methyl groups, an ethyl group or a phenyl group; cycloalkyl of 4 to 8 carbon atoms optionally containing one or more double bonds;

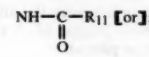


β-phenylethyl; γ-phenyl-propyl; β-phenylethylidine; cyclopropyl-methyl; 1-cyclopropylethyl; hydroxyl; alkoxy of 1 to 8 carbon atoms; alkenyloxy of 1 to 8 carbon atoms; cycloalkoxy of 3 to 6 carbon atoms; phenoxy; benzyloxy; mercapto; alkylmercapto of 1 to 8 carbon atoms; cycloalkylmercapto of 3 to 6 carbon atoms; phenylmercapto; benzylmercapto; p-chlorobenzylmercapto; alkylsulfinyl of 1 to 4 carbon atoms;



morpholino; thiomorpholino; thiomorpholino-S-oxide; thiomorpholino-S,S-dioxide;





n is 0 or 1;

R_1, R_2 and R_3 are each hydrogen; halogen; amino; alkylamino; dialkylamino of 1 to 4 carbon atoms; hydroxy; alkoxy of 1 to 4 carbon atoms; nitro; formylamino; aliphatic acylamino of 1 to 4 carbon atoms in the alkyl moiety; alkylsulfonylamino of 1 to 4 carbon atoms; alkylcarbonyl of 1 to 4 carbon atoms in the alkyl moiety; alkylcarbonyloxy of 1 to 4 carbon atoms in the alkyl moiety; alkoxycarbonyl of 1 to 4 carbon atoms in the alkyl moiety; aminocarbonyl, optionally substituted by one to two alkyl groups of 1 to 3 carbon atoms; cyano; alkylmercapto of 1 to 4 carbon atoms; alkylsulfoxy of 1 to 4 carbon atoms; alkylsulfonyl of 1 to 4 carbon atoms; aminosulfonyl; alkylaminosulfonyl of 1 to 4 carbon atoms; dialkylaminosulfonyl of 1 to 4 carbon atoms in the alkyl moiety; trifluoromethylsulfonyl; alkyl of 1 to 4 carbon atoms; trifluoromethyl; or phenyl;

R_4 and R_5 are each hydrogen; aliphatic hydrocarbyl of 1 to 8 carbon atoms optionally containing one to two double bonds or a triple bond; cycloalkyl of 3 to 8 carbon atoms which may be substituted with one to two methyl or ethyl groups and may contain one or more double bonds; or cycloalkyl-substituted alkyl of 3 to 8 carbon atoms in the cycloalkyl moiety and 1 to 3 carbon atoms in the alkyl moiety;

R_4 and R_5 together can also form an alkylene chain of 2 to 7 carbon atoms, so that a 3- to 8-membered heterocyclic ring is formed, which may optionally be substituted with one to two alkyl groups of 1 to 3 carbon atoms or a benzyl group, or may contain one to two double bonds or may be fused with a phenyl ring;

R_6 is hydrogen; formyl; acetyl; ethoxycarbonyl; benzyloxycarbonyl; methyl; ethyl; phenyl; or benzyl;

R_7 is hydrogen[,]; methyl; or ethyl;

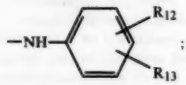
m is 0, 1 or 2;

R_8, R_9 and R_{10} are each hydrogen; halogen; amino; alkylamino of 1 to 6 carbon atoms; dialkylamino, where each alkyl moiety contains 1 to 6 carbon atoms; pyrrolidyl; piperidyl; hydroxyl; alkoxy of 1 to 6 carbon atoms; formylamino; formylalkylamino of 1 to 3 carbon atoms in the alkyl moiety; aliphatic acylamino of 1 to 3 carbon atoms; acylalkylamino of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 carbon atoms in the acyl moiety; trifluoroacetylamino; aminocarbonylamino; alkylaminocarbonylamino of 1 to 6 carbon atoms in the alkyl moiety; dialkylaminocarbonylamino of 1 to 6 carbon atoms in each alkyl moiety; nitro; alkylsulfonylamino of 1 to 4 carbon atoms in the alkyl moiety; alkylsulfonylalkylamino of 1 to 4 carbon atoms in each alkyl moiety; hydroxysulfonylamino; hydroxysulfonylalkylamino of 1 to 3 carbon atoms in the alkyl moiety; amidino; guanidino[,]; formyl[,]; alkylcarbonyl of 1 to 6 carbon atoms; benzoyl; alkylcarbonyloxy; alkoxycarbonyl or alkoxycarbonyloxy [groups] of 1 to 6 carbon atoms; formyloxy; carboxyl; aminocarbonyl; alkylaminocarbonyl of 1 to 4

carbon atoms in the alkyl moiety; dialkylaminocarbonyl of 1 to 4 carbon atoms in each alkyl moiety; aminocarboxyl; alkylaminocarboxyl of 1 to 4 carbon atoms in the alkyl moiety; dialkylaminocarboxyl of 1 to 4 carbon atoms in each alkyl moiety; alkoxycarbonylamino of 1 to 4 carbon atoms in the alkoxy moiety; alkoxycarbonylalkylamino of 1 to 4 carbon atoms in each alkyl moiety; cyano; mercapto, alkylmercapto of 1 to 6 carbon atoms; trifluoromethylmercapto; alkylsulfoxy of 1 to 6 carbon atoms; alkylsulfonyl of 1 to 6 carbon atoms; trifluoromethylsulfonyl; aminosulfonyl; alkylaminosulfonyl of 1 to 4 carbon atoms; dialkylaminosulfonyl of 1 to 4 carbon atoms; hydroxysulfonyl [of 1 to 4 carbon atoms]; alkoxysulfonyl of 1 to 4 carbon atoms; aminosulfonyloxy [,]; alkylaminosulfonyloxy of 1 to 4 carbon atoms [,]; dialkylaminosulfonyloxy [groups] of 1 to 4 carbon atoms in each alkyl moiety; straight or branched alkyl of 1 to 6 carbon atoms, which may contain double bonds or may *further* be halo-substituted; azido; dialkylmethyleneimino of 2 to 6 carbon atoms in the alkyl moieties; dialkylaminomethylideneimino groups of 2 to 6 carbon atoms in the alkyl moieties; or phenyl;

R_{11} is hydrogen [,]; alkyl of 1 to 8 carbon atoms; alkenyl of 1 to 8 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl; benzyl;

C_xF_{2x+1}, where x is 1, 2, 3, or 4; alkoxy of 1 to 4 carbon atoms; benzyloxy [,]; cycloalkyloxy of 3 to 6 carbon atoms; amino [,]; alkylamino of 1 to 8 carbon atoms; dialkylamino of 1 to 8 carbon atoms in each alkyl moiety; cycloalkylamino of 3 to 6 carbon atoms; cycloalkyleneamino of 3 to 6 carbon atoms; [or]



or benzylamino;

R_{12} and R_{13} are each hydrogen; chlorine [,]; methoxy; *or* methyl; [or benzylamino;] and

R_{14} is alkyl of 1 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; benzyl; phenyl, optionally substituted with one to three methyl groups; amino; alkylamino of 1 to 6 carbon atoms; or dialkylamino of 1 to 6 carbon [atons] *atoms* in each alkyl moiety; or a non-toxic, pharmacologically acceptable salt thereof.

4. An antibiotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antibiotic amount of a compound of claim 1.

Re. 31,927
ELECTROSTATICALLY SPRAYABLE INSECTICIDAL FORMULATIONS

Ronald A. Coffee, Haslemere; Brian W. Young, Emmer Green, and Michael R. Middleton, Arborfield Cross, all of England, assignors to Imperial Chemical Industries PLC, London, England

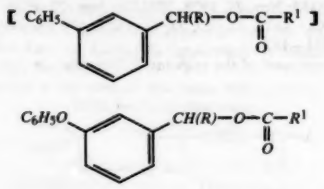
Original No. 4,316,914, dated Feb. 23, 1982, Ser. No. 137,781, Apr. 7, 1980. Continuation of Ser. No. 969,434, Dec. 14, 1978, abandoned. Application for reissue Nov. 29, 1982, Ser. No. 445,223

Claims priority, application United Kingdom, Dec. 20, 1977, 52970/77

Int. Cl.³ A01N *37/00, 37/08, 37/34*

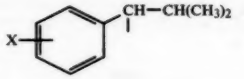
U.S. Cl. 514—521 **4 Claims**

1. An electrostatically sprayable insecticidal formulation suitable for use in an electrostatic spraying apparatus to spray plants to give an even coating of the insecticide on the leaves of said plants, the formulation having after spraying a spray droplet size in the range of from about 50 to about 200 microns in diameter, and consisting essentially of a solution of from 0.5 to 50% by weight of an insecticide in an inert organic solvent medium, said medium being a mixture of inert organic solvents or a mixture of inert organic solvents and an antistatic agent, formulated so that the formulation has a resistivity at 20° C. in the range 1×10^6 to 1×10^{10} ohm centimeters, and a viscosity at 20° C. in the range 5 to 50 centistokes, and the insecticide being of formula:



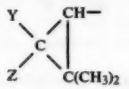
where R is hydrogen *or cyano*, and R^1 is selected from the group consisting of:

(i) a group of formula:



where X is selected from hydrogen, chlorine and methyl, and

(ii) a group of formula:



where Y and Z are selected from halogen [,] *and* methyl, [and] *or Y is hydrogen and Z is methyl or* a group of formula $R^2R^3C{=}CH{-}$, where R^2 and R^3 are selected from chlorine, bromine, methyl, ethyl, halo-substituted methyl and halo-substituted ethyl.

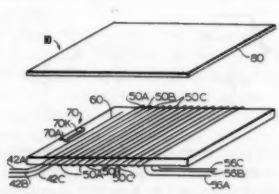
Re. 31,928
DISPLAY PANEL FOR DISPLAYING A BAR OF LIGHT

Donald E. Miller, Stockton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 4,017,759, dated Apr. 12, 1977, Ser. No. 600,838, Jul. 31, 1975. Application for reissue Oct. 11, 1977, Ser. No. 841,230

Int. Cl.³ H01J *17/04;* **H05B** *37/00*

U.S. Cl. 313—631 **4 Claims**



3. A gas discharge panel comprising

a substrate having a front surface;

a plurality of continuous electrode wires wound around said

substrate in alternating sequence, each turn of each of said plurality of wires around said substrate having a portion adjacent said front surface of said substrate, each of said turns being in alternating sequence with a turn of another of said wires to form a ladder array of said portions, each of said portions of an individual wire of each of said plurality of wires being electrically interconnected by the winding configuration of each of said plurality of wires around said substrate;

second electrode means positioned in operative relation to said electrode wires;

means forming a thin sealed envelope enclosing said front surface of said substrate; and

an ionizable gas contained in said envelope, to provide a glow discharge between said second electrode and any one of said wires for transfer along said ladder array by external electrical potential means connected to said second electrode and said wires to apply electrical potential in repeating sequence to said plurality of wires.

Re. 31,929

ELECTRONIC PACKAGE AND ACCESSORY COMPONENT ASSEMBLY

Charles J. Donaher, Los Altos Hills, and Gordon D. Christensen, San Jose, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Original No. 4,356,532, dated Oct. 26, 1982, Ser. No. 170,014, Jul. 18, 1980. Application for reissue May 27, 1983, Ser. No. 499,095

Int. Cl.[3] **H05K** *7/20*

U.S. Cl. 361—393 **10 Claims**

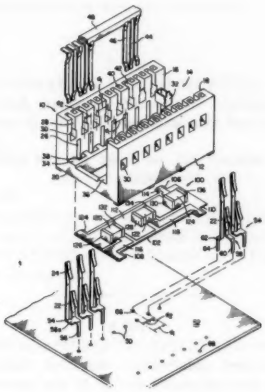
1. An electronic assembly comprising:

an electronic package having electrical contacts;

accessory component means for said package having electrical contacts for connection with said package contacts, said component means including a substrate and a component supported by said substrate, said substrate defining said component means contacts;

receptacle means having an upstanding housing defining a top opening removably receiving said package, a bottom opening removably receiving said component [means] and a channel extending between such top and bottom openings providing for residence of said package and said component [means] in vertically spaced relation in said receptacle means, said substrate being juxtaposed with a housing surface adjacent said bottom opening;

a plurality of contact elements having first portions fixedly supported in said housing, said first portions extending through said bottom opening and exteriorly thereof for engagement externally of said assembly and second portions vertically spaced from said first portions and electrically engaging said package contacts;



said substrate further including ear portions extending horizontally outwardly thereof, said contact element first portions including horizontally extending lands adjacent said housing surface, said substrate ear portions and said lands being electrically connected adjacent said housing surface.

PLANT PATENTS

GRANTED JUNE 25, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,498
CARNATION NAMED STANPIRAN

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,682
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct carnation cultivar, suostantially as herein shown and described, characterized by its continuous production of relatively large and solid light red flowers and by its ability to retain the same flower color production through all seasons.

5,499
CARNATION NAMED STANBLANCA

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,612
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its continuous production of light yellow flowers of medium size and large quantity of loosely imbricated petals.

5,500
CARNATION NAMED MUREDO

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. van Staaveren, both of Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,456
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. The new and distinct variety of miniature carnation, substantially as herein shown and described, characterized in particular by rapid production of blooms and a larger number of blooms per flower stem.

5,501
ALSTROEMERIA NAMED STALROBU

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. van Staaveren, both of Aalsmeer, Netherlands

Filed Aug. 11, 1983, Ser. No. 522,314
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct variety of alstroemeria plant, substantially as herein shown and described, characterized by the distinctive red-purple coloration of its large flowers carried by sturdy, long and generally straight umbel stems.

5,502
CHRYSANTHEMUM PLANT NAMED CHARM

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 21, 1983, Ser. No. 506,505
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., named Charm, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; light lavender pink ray floret color; diameter across face of capitulum ranging from 9 to 110 mm. at maturity; uniform eight week photoperiodic flowering response; medium plant height, and spreading branching pattern.

PATENTS

GRANTED JUN. 25, 1985

ERRATA

For CLASS	See PATENT NO.
294–099	4,524,647
367–167	4,524,693
106–035	4,524,824
280–081	4,524,841
423–235	4,525,142
604–028	4,525,156
604–052	4,525,157
556–182	4,525,307
514–210	4,525,355
514–234	4,525,356
514–258	4,525,357
514–255	4,525,358
514–653	4,525,359
514–277	4,525,360
514–689	4,525,361
514–712	4,525,362
536–028	4,525,736

PATENTS

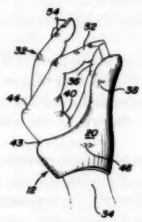
GRANTED JUNE 25, 1985

GENERAL AND MECHANICAL

4,524,463
WRAP AROUND GARMENT
Danny W. Ogden, 1605 19th, Woodward, Okla. 73801
Filed Sep. 13, 1982, Ser. No. 417,077
Int. Cl.[3] A41D *1/22*; A41B *9/14*
U.S. Cl. 2—105 **5 Claims**

1. A wrap-around garment comprising a back section having a right front section and left front section extending outwardly from opposite sides thereof, and a single body encircling means secured to only one of said front sections and extending transversely outwardly therefrom for wrapping completely around the body in a position against the outer surface only of the garment and securable in said wrapped position for securely retaining the front sections in an overlapping relationship during wearing of the garment.

4,524,464
SAFETY GLOVE WITH MODIFIED DORSAL THUMB SPICA BRACE
George A. Primiano, 125 S. Green St., E. Stroudsburg, Pa. 18301, and Frank P. Primiano, Jr., 4901 Hartley Dr., Lyndhurst, Ohio 44124
Filed Sep. 14, 1984, Ser. No. 650,629
Int. Cl.[3] A41D *19/00*
U.S. Cl. 2—161 A **19 Claims**



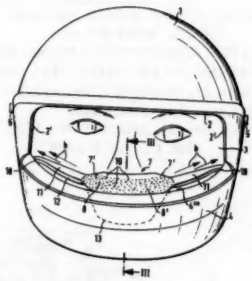
1. In a reinforced glove adapted to overfit the human hand including at least an inner layer for the engagement of the human hand and an outer layer for protection of the human hand, an improvement comprising:

(a) a modified dorsal thumb spica brace beginning distal to the wrist and extending to generally the end of the thumb including the interphalangeal joint of said thumb, thereby allowing flexion and extension of said wrist, said brace extending across said dorsal side of said hand at least proximate the ulnar border, said brace terminating distally from said wrist on the palmar side proximate the palmar crease, and on said dorsal side proximate the junction of proximal two-thirds and distal one-third of the metacarpals thus allowing free range of motion of the metacarpophalangeal joints of the second through fifth digits, said thumb portion also contoured to prevent thumb hyperextension at said metacarpophalangeal joint, and at said interphalangeal joint of said thumb, so that a wearer may retain a pole-like object in his palm by opposition; and,

(b) a pocket adapted to overfit and retain said brace between said inner and said outer layer,

whereby said brace will decrease the ulnar collateral ligament injuries involving the metacarpophalangeal joint of the thumb and adjacent bony structures of a wearer who is attempting to break the force of a fall with his open hand.

4,524,465
SAFETY HELMET, ESPECIALLY FOR MOTORCYCLISTS
Siegfried Huber, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Jul. 21, 1983, Ser. No. 515,899
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 3227410
Int. Cl.[3] A42B *1/08*
U.S. Cl. 2—424 **10 Claims**



1. A safety helmet having a viewing opening comprising pivotably mounted visor means for the viewing opening, a chin protector, and an air duct member disposed generally in the center of the chin protector of the helmet, said air duct member projecting upwardly from an upper rim of the chin protector, the air duct member being formed from an elastomeric material and having an edge zone facing the visor means, said edge zone being adapted to project past the contact area of the visor means at the chin protector whereby the air duct member is in intimate contact with the visor when the visor is opened a crack.

4,524,466
CONTINUOUS ROTATION REVERSIBLE PITCH AXIAL THRUST HEART PUMP
Charles W. Hall, and Orin M. Anderson, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.
Filed Nov. 30, 1983, Ser. No. 556,654
Int. Cl.[3] A61F *1/00, 1/24*; A61M *1/03*
U.S. Cl. 603—3 **8 Claims**

1. A continuous rotation reversible pitch impeller heart pump comprising,

a housing,

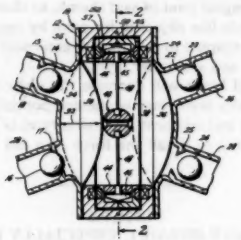
a first inlet and outlet valve connected to the housing,

a second inlet and outlet valve connected to the housing,

a first diaphragm movable in the housing for alternately

pumping fluid from the first inlet and out of the first outlet valve,

a second diaphragm movable in the housing for alternately pumping fluid from the second inlet and out of the second outlet valve,



a continuous rotation impeller thrust pump positioned in the housing between the first and second diaphragms, said impeller including a plurality of rotating blades, and

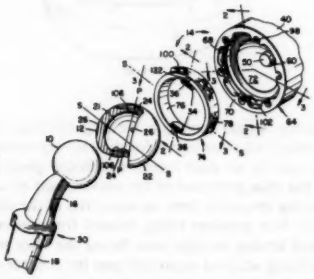
means for alternately reversing the pitch angle of said blades for alternately applying a pressure and suction stroke to each of the diaphragms for alternately pumping fluid into and out of the housing by each of the diaphragms.

4,524,467

APPARATUS FOR CONSTRAINING A SOCKET BEARING IN AN ARTIFICIAL JOINT

Alfred F. DeCarlo, Jr., Stamford, Conn., assignor to Joint Medical Products Corp., Stamford, Conn.

Filed Nov. 21, 1983, Ser. No. 553,518
Int. Cl.³ A61F *1/04*
U.S. Cl. 603—22 **1 Claim**



1. A ball and socket joint for implanting in the body which comprises:

a ball;

a cup with a spherical cavity, said cup including first and second elements, the first element to be affixed to bone and the second element having associated therewith two spaced apart coaxial pin members which extend into the spherical cavity and whose common axis defines an axis of rotation, said second element being moveable with respect to the first element to provide a plurality of possible orientations for said axis of rotation, said cup having a projection in the form of an axially symmetric pin extending into the spherical cavity at the geometric pole of the cavity; and

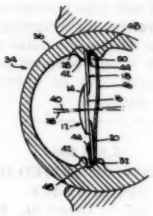
a bearing member surrounding a portion of the ball and rotatable within said spherical cavity about said coaxial pin members, the axis of rotation of the bearing member being the axis of rotation defined by the common axis of the pin members, said bearing member including an aperture for receiving the projection, said aperture having end walls and side walls, the projection and the aperture being sized so that the projection can be received in the aperture for each of the possible orientations of the axis of rotation, the rotation of the bearing being constrained by engagement of an end wall of the aperture with the projection.

4,524,468

INTRAOCULAR LENSES

Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy. Bldg. 3, Floral Park, N.Y. 11005

Filed May 13, 1983, Ser. No. 494,306
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 603—6 **10 Claims**



1. An intraocular lens suitable for use as an artificial lens implant, the lens comprising:

a medial, light-focusing, lens body intended to be positioned adjacent to the pupil in the posterior chamber of the eye, and a pair of position fixation members connected with said lens body;

one of said position fixation members extending generally laterally outwardly from a first region of the periphery of said lens body and intended to extend to and seat adjacent to the periphery of the iris in the vascular tissue of the ciliary sulcus;

the other of said position fixation members extending generally laterally outwardly from a second region of the periphery of said lens body and intended to extend to and resiliently seat in the non-vascular tissue of the cul-de-sac formed between the anterior and posterior capsules of the eye;

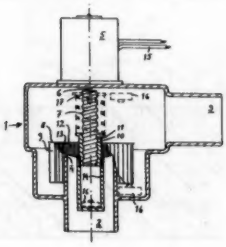
said one position fixation member comprising a first material which is substantially biologically inert to the environment within the eye and exhibits a given springiness and said other position fixation member comprising a second material which is substantially less biologically inert to the environment within the eye than said first material and exhibits a substantially greater springiness than said first material;

whereby, when the lens is seated in the eye, the vascular tissue of the ciliary sulcus will be in contact only with said substantially biologically inert material and said substantially less biologically inert material will be in contact only with the non-vascular tissue of the posterior capsule of the eye.

4,524,469
COMBINED FAN AND VALVE

Per-Erik Magnusson, V. Frölunda, Sweden, assignor to Lagerstedt & Krantz AB, Gothenburg, Sweden

PCT No. PCT/EP82/00006, § 371 Date Sep. 8, 1982, § 102(e) Date Sep. 8, 1982, PCT Pub. No. WO82/02568, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 18, 1982, Ser. No. 417,116
Claims priority, application Sweden, Jan. 22, 1981, 8100360
Int. Cl.[3] E03D 9/02
U.S. Cl. 4—216 2 Claims



1. A combined fan and valve suitable for use with a water closet, comprising:

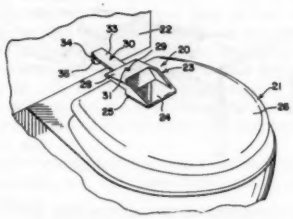
a substantially vertical motor-driven drive shaft having spindle threads; and

a fan wheel having an electric sealing membrane attached thereto adapted to seal against a valve seat positioned in the housing and a hub including spindle threads for cooperation with the threads of the drive shaft, the drive shaft threads and the hub threads having a pitch sufficiently large to overcome frictional forces between the drive shaft threads and the hub threads by the force of gravity on said fan wheel when the drive shaft is standing still, whereby said fan wheel and said sealing membrane continue to rotate after the shaft has stopped and move downwardly, screwing said sealing membrane tightly against the valve seat.

4,524,470
TOILET LID LOCK MECHANISM

David J. Grenell, 1396 Hadden Cir., Akron, Ohio 44313

Filed Oct. 9, 1984, Ser. No. 659,010
Int. Cl.[3] A47K 13/24
U.S. Cl. 4—253 2 Claims



1. For use, in combination with a hinged toilet lid and an apron surface disposed substantially perpendicular with respect to the plane of said lid a lock mechanism normally restraining a manual raising movement of said toilet lid about a lid hinge;

said lock mechanism having a lid control shoe with an outer portion having an under surface adapted for attachment to an upper surface on said lid and a shelf portion projecting toward said toilet apron surface above said lid upper surface, the under side of said shoe shelf having a medially positioned pivot;

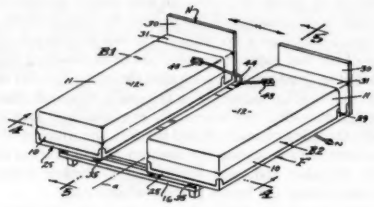
said lock mechanism further having a lid control arm movably rotatably mounted at said shoe shelf pivot, said arm having, when in a locking position, a short portion on one side of said pivot extending toward said shoe outer portion and a long portion on the other side of said pivot extending toward an area adjacent said toilet apron surface, said control arm long portion having an inwardly directed side at the end thereof, away from said pivot, said control arm long portion carrying a vertical flange extending substantially parallel to said apron surface;

said lock shoe shelf carrying a tension means and a stop means to normally position said control arm vertical flange in proximity to said toilet apron surface and to allow movement of said flange away from said apron when said arm is manually pivoted.

4,524,471
POWER OPERATED SEPARABLE BEDS AND SUPPORT THEREFOR

Mansour N. Mansouri, 1717 Sanysidro Dr., Beverly Hills, Calif. 90210; Masoud N. Mansouri, 1110 N. Bundy Dr., Los Angeles, Calif. 90049, and Kambiz Imani, 11667 Ohio Ave., Los Angeles, Calif. 90025

Filed Jan. 5, 1984, Ser. No. 568,347
Int. Cl.[3] A47C 19/00
U.S. Cl. 5—8 6 Claims



1. A composite bedding unit comprised of two like and adjoining single bed units and each having a head and foot rail and adapted to be juxtaposed to a median line in a primary double bed condition and to be separated from the median line to a secondary single bed condition, and including;

transverse horizontally disposed guide tracks upstanding from a floor supported base at both the head rail and foot rail of and extending parallel one with the other and substantially coextensively beneath the widths of the two single bed units when they are adjacently juxtaposed at the median line in said double bed condition,

laterally spaced support rollers carried by the head and foot rails and engageable over the guide tracks to individually carry each of the two single bed units for transverse movement toward and away each other,

transverse downwardly disposed stabilizing tracks parallel with and overlying a portion of each of the guide tracks and each stabilizing track extending from the median line a distance less than the extent of the guide tracks and substantially equal to the travel of the single bed unit,

each bed unit having at least one roller carried at the inner ends of the head and foot rails to engage upwardly against the stabilizing tracks when the bed unit is cantilevered,

and transport means for positioning either and both of the two single bed units by transverse movement into either of said primary double bed condition and said single bed condition.

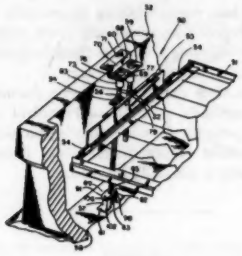
4,524,472
COFFIN BED ADJUSTING APPARATUS

Robert K. Foust, 301 Mary Kay, Connersville, Ind. 47331

Continuation-in-part of Ser. No. 405,993, Aug. 6, 1982, Pat. No. 4,404,716. This application Aug. 25, 1983, Ser. No. 526,170

Int. Cl.³ A61G 7/00

U.S. Cl. 5—62 **23 Claims**



1. An apparatus for elevating a bed in a burial casket, said apparatus comprising:

an elevating support member;

a bed support member pivotally mounted to said elevating support member, said bed support member including an elongated slot which has a first slot end and a second opposite slot end, said first slot end being closer to said pivoting point than said second opposite slot end;

tilting means mounted to said elevating support member, said tilting means including an arm which is slidably received in said elongated slot so that the sliding of the arm causes contact with the walls of the slot resulting in pivoting of the bed support member about its pivoting point;

a bracket in fixed relation with said elevating support member, said bracket including an internally threaded channel;

a vertical threaded rod threadedly engaged with said internally threaded channel of said bracket, the rotation of said rod vertically adjusting the position of said bracket along said threaded rod, said threaded rod further having a keyway along the lower portion of said rod;

mounting means for vertically mounting said threaded rod to said casket in free rotation, said mounting means including a first mounting member attachable to the casket at the base of the casket, said first mounting member defining an aperture through which said lower end of said threaded rod is insertable;

a first stop member having a threaded aperture threadedly received on said rod above said first mounting member;

a second stop member defining a key aperture received on said rod above said first mounting member, said second stop member engaging said keyway to be slidable along said rod and to be immobile in a rotational direction about said rod;

stop member locking means for locking said first stop member to said second stop member to form a stop assembly which engages with said first mounting member to maintain a fixed length of said rod inserted into said aperture.

4,524,473
FOAM MATERIAL BODY FOR A PAD, PARTICULARLY A MATTRESS

Hansruedi Fanti, Flüh, Switzerland, assignor to Matra AG, Flüh, Switzerland

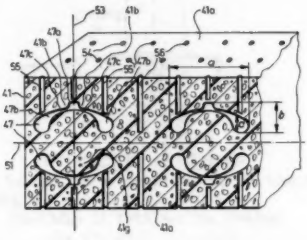
Continuation-in-part of Ser. No. 188,595, Sep. 19, 1980, Pat. No. 4,397,053. This application Jan. 10, 1983, Ser. No. 456,759

Claims priority, application Switzerland, Sep. 20, 1979, 8481/79

Int. Cl.³ A47C 27/14

U.S. Cl. 5—481 **20 Claims**

1. A foam material body for a pad, particularly a mattress, comprising a body part having in a position lying on a horizontal surface, a longitudinal inner plane and two supporting surfaces located at both sides of the latter, said body part having a plurality of channels located at both sides of said longitudinal inner plane and extending parallel to one another, each of said channels having a transverse plane of symmetry extending normal to said longitudinal inner plane of said body part, and each of said channels having a middle channel portion arranged at said plane of symmetry of the same channel, two deep channel portions located at opposite sides of said transverse plane of symmetry of the same channel and each including an end distant from said middle channel portion and



a constriction between said end and said middle channel portion of the same channel, each of said deep channel portions of each of said channels being elongated and having a depth measured from the respective supporting surface and increasing in a direction away from said transverse plane of symmetry, each of said deep channel portions of each of said channels having a side facing toward said longitudinal inner plane and being limited at said side by a body part portion which forms a limiting face, said limiting face of each of said deep channel portions of each of said channels being curved in a direction away from said transverse plane of symmetry at least partially toward said longitudinal inner plane.

4,524,474
ABSORPTION PAD

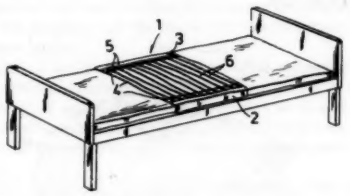
Sven A. T. Svensson, Halmstad, Sweden, assignor to Duni Bila AB, Sweden

Filed Apr. 26, 1983, Ser. No. 488,742

Claims priority, application Sweden, Apr. 29, 1982, 8202716

Int. Cl.³ A47G 9/02; A61G 9/00

U.S. Cl. 5—484 **9 Claims**



1. An absorption pad for protecting a bed, furniture, or the like, the pad comprising:

a liquid impervious material layer, a liquid absorbent layer affixed over the impervious layer;

a liquid resistant agent impregnated into the absorbent material layer; the impregnated agent being arrayed over the absorbent material layer in a plurality of strings of the agent for defining a pattern of compartments separated by the strings for limiting the spread of liquid over the pad the layers being laminated together in such a manner that liquid migration under the strings is prevented, whereby

after a compartment is saturated with liquid, the liquid overflows over the strings into adjacent compartments.

4,524,475

HOSPITAL BED STEP

Pearl T. Valentino, 5002 - 9 Ave., Rear Ground, Brooklyn, N.Y. 11220

Filed Mar. 22, 1984, Ser. No. 592,265
Int. Cl.³ A47C *19/22*
U.S. Cl. 5—507 **1 Claim**

1. A hospital bed step, comprising in combination:
(a) an adjustable step support rod which has a multiplicity of diametrically opposed holes placed at different heights along said support rod;
(b) a rail clamp which is attached to said adjustable step support rod, for securement to a top rail on a hospital bed which has three sides which are perpendicular to each other, wherein when said rail clamp is placed upon said top rail the top of said top rail and the front and back of said top rail are in direct contact with said rail clamp;
(c) means for locking said rail clamp to, said top rail on said hospital bed, which is a pair of threaded thumbscrews with mating thumbscrew bushings mounted to one side of said rail clamp wherein said thumbscrews force said top rail and said rail clamp together.
(d) a step upon which a patient may step in order to climb into said hospital bed;
(e) a step support bracket rigidly welded to said step;
(f) a step support clamp which is a length of tubing with at least one pair of diametrically opposed holes rigidly welded to said step support bracket;
(g) means for locking said step clamp with associated attached said step support bracket and said step, to said adjustable step support rod such that said step is rigidly fixed when a patient steps upon said step, which comprises a locking bar which passes through both said diametrically opposed holes in said step support clamp and through said diametrically opposed holes in said adjustable step support rod, an end stop on one end of said locking bar and a latch and pivot on the opposing end wherein once said locking bar has been inserted through said diametrically opposed holes, said latch which is shaped to pass through said holes may be rotated by ninety degrees thereby preventing the removal of said locking bar without first rotating said latch another ninety degrees; and
(h) means for storing said step under said hospital bed without removing said rail clamp from said top rail of said hospital bed.

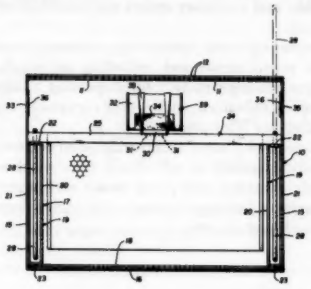
4,524,476

BEE SHIPPING BOX AND HIVE

John Q. Adams, IV, 1206 Foxcroft Rd., Richmond, Va. 23229

Filed Feb. 14, 1984, Ser. No. 580,124
Int. Cl.³ A01K *47/00*
U.S. Cl. 6—1 **7 Claims**

1. A bee shipping box and beehive unit comprising a rectangular open top box body having hinged top closure flaps, a reinforcing insert removably mounted in the box body and resting on the bottom wall thereof and including end hollow spacing members adjacent to the end walls of the box body and having top support surfaces, plural frames having top bars resting on said support surfaces, flexible handles connected with the spacing members by means of which the insert and



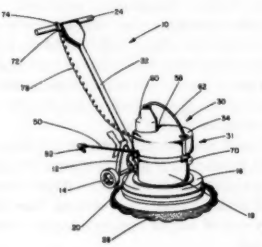
frames are liftable bodily from the box body, a feeder assembly mounted removably on the frame top bars within the top portion of the box body, and a screen closure section within the box body above the frames and having end bars adapted to be releasably secured to the side walls of the box body.

4,524,477

CLEANING SOLUTION DISPENSER ATTACHMENT FOR ROTARY FLOOR CLEANING MACHINE

Robert C. Williams, III, Raleigh, and Stephen R. Williams, Cary, both of N.C., assignors to U.S. Floor Systems, Inc., Raleigh, N.C.

Filed May 21, 1984, Ser. No. 612,449
Int. Cl.³ B05B *15/06;* **A47L** *11/34*
U.S. Cl. 15—50 R **10 Claims**



1. A floor cleaning solution applicator attachment for attachment to an individually propelled rotary floor cleaning machine of the type having a mobile main frame, an electric motor supported by said mobile main frame and having a motor housing structure surrounding the same, a rotary floor cleaning assembly operatively connected and driven by said electric motor and operative to drive a bonnet type cleaner, and a handle assembly operatively connected to said mobile main frame and extending therefrom, said floor cleaning applicator attachment, comprising:
A. a pump housing structure;
B. adjustable connecting means for attaching and detaching said pump housing structure to the top of said electric motor housing structure;
C. electric pump means mounted within said pump housing structure and including an inlet and outlet;
D. container receiving means associated with said pump housing structure for receiving and holding a container;

4,524,472
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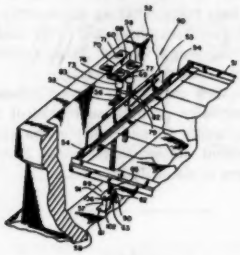
Int. Cl.³ A61G 7/00

U.S. Cl. 5—62 23 Claims



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an elevating support member;

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tilting means mounted to said elevating support member, said tilting means including an arm which is slidably received in said elongated slot so that the sliding of the arm causes contact with the walls of the slot resulting in pivoting of the bed support member about its pivoting point;

a bracket in fixed relation with said elevating support member, said bracket including an internally threaded channel;

a vertical threaded rod threadedly engaged with said internally threaded channel of said bracket, the rotation of said rod vertically adjusting the position of said bracket along said threaded rod, said threaded rod further having a keyway along the lower portion of said rod;

mounting means for vertically mounting said threaded rod to said casket in free rotation, said mounting means including a first mounting member attachable to the casket at the base of the casket, said first mounting member defining an aperture through which said lower end of said threaded rod is insertable;

a first stop member having a threaded aperture threadedly received on said rod above said first mounting member;

a second stop member defining a key aperture received on said rod above said first mounting member, said second stop member engaging said keyway to be slidable along said rod and to be immobile in a rotational direction about said rod;

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4,524,473
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U.S. Cl. 5—481 20 Claims

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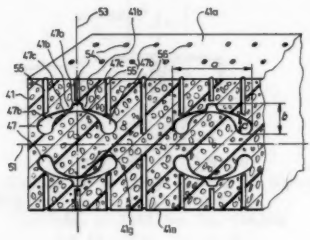

a constriction between said end and said middle channel portion of the same channel, each of said deep channel portions of each of said channels being elongated and having a depth measured from the respective supporting surface and increasing in a direction away from said transverse plane of symmetry, each of said deep channel portions of each of said channels having a side facing toward said longitudinal inner plane and being limited at said side by a body part portion which forms a limiting face, said limiting face of each of said deep channel portions of each of said channels being curved in a direction away from said transverse plane of symmetry at least partially toward said longitudinal inner plane.

4,524,474
ABSORPTION PAD

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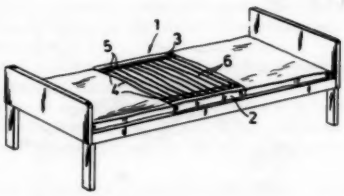
Filed Apr. 26, 1983, Ser. No. 488,742

Claims priority, application Sweden, Apr. 29, 1982, 8202716

Int. Cl.³ A47G 9/02; A61G 9/00

U.S. Cl. 5—484 9 Claims



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a liquid resistant agent impregnated into the absorbent material layer; the impregnated agent being arrayed over the absorbent material layer in a plurality of strings of the agent for defining a pattern of compartments separated by the strings for limiting the spread of liquid over the pad the layers being laminated together in such a manner that liquid migration under the strings is prevented, whereby

after a compartment is saturated with liquid, the liquid overflows over the strings into adjacent compartments.

4,524,475

HOSPITAL BED STEP

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Filed Mar. 22, 1984, Ser. No. 592,265
Int. Cl.³ A47C *19/22*
U.S. Cl. 5—507 **1 Claim**

1. A hospital bed step, comprising in combination:
(a) an adjustable step support rod which has a multiplicity of diametrically opposed holes placed at different heights along said support rod;
(b) a rail clamp which is attached to said adjustable step support rod, for securement to a top rail on a hospital bed which has three sides which are perpendicular to each other, wherein when said rail clamp is placed upon said top rail the top of said top rail and the front and back of said top rail are in direct contact with said rail clamp;
(c) means for locking said rail clamp to, said top rail on said hospital bed, which is a pair of threaded thumbscrews with mating thumbscrew bushings mounted to one side of said rail clamp wherein said thumbscrews force said top rail and said rail clamp together.
(d) a step upon which a patient may step in order to climb into said hospital bed;
(e) a step support bracket rigidly welded to said step;
(f) a step support clamp which is a length of tubing with at least one pair of diametrically opposed holes rigidly welded to said step support bracket;
(g) means for locking said step clamp with associated attached said step support bracket and said step, to said adjustable step support rod such that said step is rigidly fixed when a patient steps upon said step, which comprises a locking bar which passes through both said diametrically opposed holes in said step support clamp and through said diametrically opposed holes in said adjustable step support rod, an end stop on one end of said locking bar and a latch and pivot on the opposing end wherein once said locking bar has been inserted through said diametrically opposed holes, said latch which is shaped to pass through said holes may be rotated by ninety degrees thereby preventing the removal of said locking bar without first rotating said latch another ninety degrees; and
(h) means for storing said step under said hospital bed without removing said rail clamp from said top rail of said hospital bed.

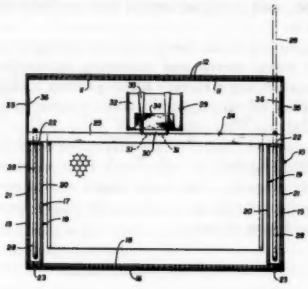
4,524,476

BEE SHIPPING BOX AND HIVE

John Q. Adams, IV, 1206 Foxcroft Rd., Richmond, Va. 23229

Filed Feb. 14, 1984, Ser. No. 580,124
Int. Cl.³ A01K *47/00*
U.S. Cl. 6—1 **7 Claims**

1. A bee shipping box and beehive unit comprising a rectangular open top box body having hinged top closure flaps, a reinforcing insert removably mounted in the box body and resting on the bottom wall thereof and including end hollow spacing members adjacent to the end walls of the box body and having top support surfaces, plural frames having top bars resting on said support surfaces, flexible handles connected with the spacing members by means of which the insert and



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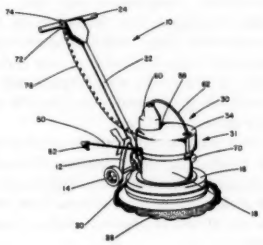
Int. Cl.³ B05B *15/06;* **A47L** *11/34*
U.S. Cl. 15—50 R **10 Claims**



1. A floor cleaning solution applicator attachment for attachment to an individually propelled rotary floor cleaning machine of the type having a mobile main frame, an electric motor supported by said mobile main frame and having a motor housing structure surrounding the same, a rotary floor cleaning assembly operatively connected and driven by said electric motor and operative to drive a bonnet type cleaner, and a handle assembly operatively connected to said mobile main frame and extending therefrom, said floor cleaning applicator attachment, comprising:
A. a pump housing structure;
B. adjustable connecting means for attaching and detaching said pump housing structure to the top of said electric motor housing structure;
C. electric pump means mounted within said pump housing structure and including an inlet and outlet;
D. container receiving means associated with said pump housing structure for receiving and holding a container;

E. container means for being received by said container receiving means of said pump housing structure in order that said container means may be supported and held by said pump housing structure;

F. connecting line means operatively interconnected between said container means and said inlet of said pump means;

G. dispensing means operatively connected to said outlet of said pump means and extending outwardly from said pump housing structure for dispensing a carpet cleaning solution contained within said container means onto an underlying floor area; and

H. on-demand control means adapted to be mounted on said handle assembly of said rotary floor machine for selectively actuating said pump means and dispensing carpet cleaning solution as desired as the rotary floor machine is moved over an area.

4,524,478

TOOTHBRUSH

L. Wayne Ross, 1107 Church St., Bastrop, Tex. 78602

Filed Jun. 17, 1983, Ser. No. 505,433
Int. Cl.³ A46B *9/04*
U.S. Cl. 15—106 **3 Claims**

1. A toothbrush comprising:

an enlongated generally square handle with an intermediate portion having a longitudinal axis, and,

said handle containing four labels clearly indicating locations of intended usage, said four labels being prominently displayed and being located at or near ends of said handle, with two of said labels being at each end of said handle, and two labels at each end of said handle being located on opposite sides thereof, and,

a pair of neck portions respectively secured to opposite ends of said handle, said neck portions extending in substantially parallel planes but with curved sides bringing ends of said neck portions most remote from said handle completely out of and at opposite angles to said longitudinal axis, and

a pair of neck ends respectively secured to opposite ends of said handle by means of said neck portions, said neck ends extending in nonparallel planes by virtue of placement on said neck portions at opposite angles of approximately 45 degrees to and rotated around said longitudinal axis, and,

said neck ends having bristle tufts secured thereto so as to form bristle arrangements that extend perpendicularly from said neck ends, with said neck ends oriented so said bristle arrangements generally oppose each other in direction, and

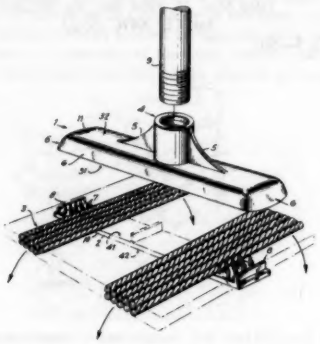
said bristle arrangements each consisting of three component portions of bristle tufts, said three portions of bristle tufts generally arranged in rows and extending the entire lengths of said neck ends, said three portions of bristle tufts generally perpendicular to said neck ends, said bristle arrangements being diametrically opposed to each other in arrangement on said neck ends, whereby said bristle arrangements can be more specialized and improved in the effective removal of plaque from user's teeth and gumline.

4,524,479

REPLACEABLE PLASTIC MOPHEAD

Paul O. Wright, Schenectady, N.Y., assignor to White Mop Wringer Company, Fultonville, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,722
Int. Cl.³ A47L *13/24*
U.S. Cl. 15—147 R **13 Claims**



1. A mophead comprising:

a first element having a rigid base and a plurality of substantially uniform fingers, the fingers being spaced apart in two dimensions along and projecting from one side of the base in a first spaced relationship, the distance between two adjacent fingers measured perpendicular to the longitudinal axis of a predetermined size mopstrand being less than the diameter of a mopstrand;

a second element having a rigid base and a plurality of substantially uniform fingers, the fingers being spaced apart in two dimensions along and projecting from one side of the base in a second spaced relationship, the distance between two adjacent fingers measured perpendicular to the longitudinal axis of a predetermined size mopstrand being less than the diameter of a mopstrand;

a water-absorbent mop material comprising a plurality of individual strands substantially uniformly dispersed along and between the first and second elements wherein each strand has a diameter greater than the distance between two adjacent fingers; and

a first means for permanently securing the first and second elements together and for securing the water absorbent mop material between the first and second elements, wherein the first spaced relationship corresponds to the second spaced relationship so that the fingers of the first and second elements project in opposition, and collectively contact, penetrate, and displace local areas of the individual strands of water-absorbent mop material adjacent each finger penetration to provide substantially the sole means for holding the strands together and in the mophead and for preventing any strand from being pulled out of the mophead.

4,524,480

WIRE WHEEL COVER BRUSH

Stephen R. Bloom, Bloomfield Hills, Mich., assignor to Perfection Automotive Products Corp., Livonia, Mich.

Filed Aug. 1, 1983, Ser. No. 519,048
Int. Cl.³ A46B *9/02*
U.S. Cl. 15—159 A **1 Claim**

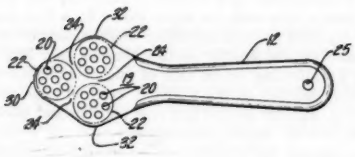
1. A wire wheel cover brush for cleaning a vehicle wire wheel cover having a plurality of wire wheel cover spokes and a spaced apart wire wheel cover back-up plate, comprising:

a handle portion adapted for being gripped by a user;

a tapering head portion having a rounded front edge and

two rounded side edges, said head portion including first and second side surfaces tapering from said side edges to said front edge to form a first corner at said front edge and to allow said edges to get between said wire wheel cover spokes, said head portion converging from said two side edges, opposite said front edge, towards said handle portion to prevent said head portion from being hung up between said wire wheel cover spokes upon removal from behind the plane of said wire wheel cover spokes, third and fourth side surfaces tapering from said side edges to said handle portion, said third side surface and said first side surface converging to one of said side edges to form a second corner at said one side edge, and said fourth side surface and second side surface converging to the other side edge to form a third corner at said other side edge;

a brush bristle portion projecting from the upper surface of said head portion, wherein said brush bristle portion having at least two different lengths of brush bristles so that said longer brush bristles will get through said wire wheel cover spokes to said back-up plate and some of said shorter brush brustles will contact and fold around said wire wheel cover spokes, and said brush bristle portion having a plurality of U-shaped bristles gathered together in a plurality of tufts, and said tufts positioned in only three circular groupings of sufficient density to prevent undue bending of said brush bristles upon contacting said back-up plate, a plurality of tuft anchoring holes formed in



said brush head portion upper surface normal to said brush head portion upper surface, said anchoring holes positioned only in said three circular groupings and fastening means for anchoring said tufts in said tuft anchoring holes, a first circular grouping positioned at said first corner, said first grouping substantially occupying the space defined between said first and second side surfaces adjacent said front edge, a second circular grouping positioned at said second corner, said second grouping substantially occupying the space defined between said first and third side surfaces adjacent said one side edge, and a third circular grouping positioned at said third corner, said third grouping substantially occupying the space defined between said second and fourth side surfaces adjacent said other side edge;

said front edge and said side edges of said head portion being slightly rounded to allow further penetration of said bristle portion beyond the plane of said wire wheel spokes; and

said groupings being positioned in a triangular arrangement, a predetermined space separating said groupings sufficient to allow said wire spokes to pass between said groupings whereby said groupings can penetrate between said wire spokes to said back-up plate and simultaneously clean both said wire spokes and said back-up plate without said brush bristles within each grouping being separated by said spokes.

4,524,481

DUAL BLADE WINDSHIELD WIPER

Pieter C. Koomen, 132 W. Surrey, Phoenix, Ariz. 85029

Filed Nov. 28, 1983, Ser. No. 555,585

Int. Cl.³ B60S *1/38*

U.S. Cl. 15—250.41 **12 Claims**

1. A flexible wiper attachable to a harness for wiping fluids from a surface, said wiper comprising in combination:

(a) a flexible body portion;

(b) a flexible U-shaped membrane formed as part of said body portion and having a pair of opposed sides depending from said body portion and a base section interconnecting said depending opposed sides;

(c) a central rib and two lateral ribs bracketing said central rib formed as part of and extending from said base section; and

(d) means formed as part of and depending from said body portion intermediate said opposed sides for exerting a force directly upon said base section during operation of said wiper.

4,524,482

UNITARY RESILIENT BEARING SUPPORT

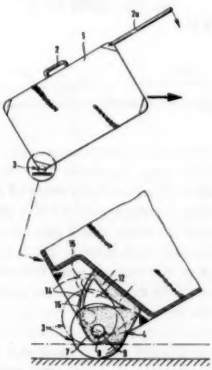
Christoph Mueller, Kleiner Muristalden 28, CH-3006 Bern, Switzerland

Filed Jan. 14, 1983, Ser. No. 457,902

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3202007

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—44 **5 Claims**



1. Bearing support for a container which is adapted to be rolled along a support surface via transport roller means disposed on rotatable axle means at the bottom of the container comprising:

a unitary resilient bearing part having upper and lower portions and a cavity of substantially triangular cross section extending therethrough at a position between said upper and lower portions, said cavity being delimited by three cavity walls and three parallel apices formed by the respective intersection of said cavity walls, wherein said triangular cavity has one short side and two other sides

longer than said short side, said short side positioned on a rear position of the bearing support when said support is in a forward travelling condition, wherein one of said walls at said short side is curved slightly outward with respect to points within said triangular cavity so that a compression of the bearing part results in a bending flexure of said one wall, wherein the other two walls of the triangular cavity are curved to arch in a convex shape relative to points within the triangular cavity, wherein the other two walls are configured to increasingly abuttingly engage one another from the apex toward said short side in response to increased compression of the bearing part and resulting shortening of said short side, whereby the resistance to compression of said bearing support is increased as the compression forces are increased,

roller bearing means integral with said lower portion of said resilient bearing part for rotatably supporting said axle means, and

connecting means integral with said upper portion of said resilient bearing part for connecting said bearing part to container frame means,

wherein, in use, said one wall of said cavity is substantially perpendicular to said supporting surface and the apices of said cavity are parallel to said axle means whereby shock forces effecting relative movement of said roller means and said frame means are resiliently absorbed by compression of said resilient bearing part, by flexural bending of said one wall of said triangular cavity and by elastic pivoting movement of the remaining two walls of said cavity about their respective apex.

4,524,483

ADJUSTABLE LENGTH FLEXIBLE HANDLE

Thomas F. Lynham, and Lee J. Curtis, both of c/o MacNeills Warehouse, Newhams Row, 175 Bermondsey St., London, SE1, England

Filed Jan. 19, 1984, Ser. No. 572,004

Claims priority, application United Kingdom, Jan. 20, 1983, 8301496

Int. Cl.³ A47B *95/02*

U.S. Cl. 16—114 R **9 Claims**

1. An article of furniture comprising a door and/or a drawer which are openable and closeable by a handle, the handle comprising a hollow elongate body made of a flexible material, a pair of end collar members which are a sliding fit one over each end portion of the body, and a pair of screw members for screwing one into each end portion of the body to secure the body to the door or the drawer with the end collar members abutting the door or the drawer, the end collar members being slideable along the entire length of the body so that the body can be cut to any desired length to fit any existing handle holes in the door or the drawer and to have any desired curvature permitted by the flexible material, the end collar members being a sufficiently tight sliding fit that they act to try and prevent outward expansion of the end portions of the body as the screw members are screwed into position in the end portions of the body so that the end portions become firmly sandwiched between the collar members and the screw members, and the body having a bore which is of a size that enables the screw members to bite into the flexible material as the screw members are screwed into position and which is of a uniform size along its length so that the screw members can be screwed into the end portions of the body irrespective of where the body may have been cut without the need for bore enlargement to receive the screw members.

4,524,484

EXTENSION HANDLE HAVING COOPERATING MALE AND FEMALE LOCKING SLEEVES

John W. Graham, Simpsonville, S.C., assignor to Swiss-Tex, Incorporated, Piedmont, S.C.

Filed Jun. 15, 1983, Ser. No. 504,627

Int. Cl.³ B25G *1/04*

U.S. Cl. 16—115 **4 Claims**

1. An extension handle for manipulating a tool, such as a window washing device, and comprising first and second tubular pole members each formed of relatively thin material formed into a tube with the edges joined by a lock seam of multiple layers of material extending longitudinally of the tube and located on the interior surface thereof, said lock seam defining a reinforcing rib on each of said pole members, said second pole member having a smaller external diameter than the internal diameter of said first pole member and having an inner end portion thereof telescopically received within said first pole member and another portion thereof extending outwardly from one end of said first pole member, and locking means carried by said one end of said first pole member and slidably receiving said second pole member therein for locking said second pole member in one of a number of extended or retracted positions, said locking means comprising a first tubular member including a mounting sleeve on one end and including a beveled free end to aid in inserting and providing a snug fit in said one end of said first pole member, an internal bore extending throughout the length of said first tubular member for slidably and guidingly receiving said second pole member therein, an externally threaded medial portion, and a gripping portion at its other end, said gripping portion having a plurality of longitudinally extending slots defining a plurality of gripping fingers such that said second pole member may be grippingly and lockingly engaged thereby, the outer end portion of said gripping portion being beveled on its exterior surface to define a cam surface, said locking means further comprising a second tubular member being internally threaded to mate with the externally threaded medial portion of said first tubular locking member and having an internally beveled portion at its outer end to define a mating cam surface for the cam surface on said gripping portion of said first locking member, whereby said gripping fingers are inwardly compressed into gripping engagement with said second pole member when said second tubular member is threaded onto said first tubular member to lock said second pole member in adjusted position relative to said first pole member, whereby said gripping fingers are released from gripping engagement with said second pole member when said second tubular member is unthreaded to permit adjustment of said first pole member relative to said second pole member, wherein said mounting sleeve on said one end of said first tubular member is provided with a slot extending longitudinally from the free end thereof and being wider adja-

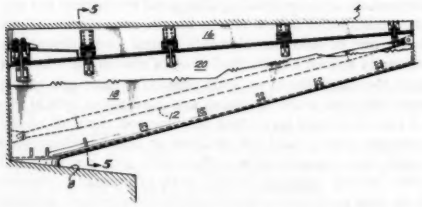
cent the free end thereof, the narrower end of said slot being of sufficient width and depth to closely straddle said reinforcing rib extending interiorly of said first pole member, and wherein said mounting sleeve of said first tubular member is pressed into said one end of said first pole member so that said beveled free end causes the wider end of said slot to narrow and engage opposite sides of said reinforcing rib, said longitudinal slot preventing rotation of said first tubular member in said first pole member when said second tubular member is threaded onto said first tubular member.

4,524,485

HINGE STRUCTURE WITH CONTROLLED TRANSLATION OF HINGE AXIS

Alfred W. Harris, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 27, 1983, Ser. No. 498,948
Int. Cl.³ E05D *15/06*
U.S. Cl. 16—364 **39 Claims**



1. For use in a system in which a hinge knuckle is rigidly mounted on a first structure and a hinge pin having a longitudinal axis is carried by a second structure for pivotally engaging the hinge knuckle with the knuckle being pivotable about said axis, means for allowing controlled translational movement of one of said structures relative to the other of said structures to prevent excessive hinge loads, comprising:

a hinge pin carrier to which the hinge pin is attached;

mounting means for slidably mounting the carrier onto the second structure to allow movement of the carrier relative to the second structure in either direction along a line essentially perpendicular to the longitudinal axis of the hinge pin; and

spring means positioned between a portion of the second structure and a portion of the carrier for controlling said movement of the carrier and for biasing the carrier into an intermediate set position;

wherein the first structure, hinge knuckle, hinge pin, and carrier move as a unit with respect to the second structure when one of said structures is subjected to a load tending to move it along said line; and

wherein the spring means is positioned to be compressed by movement of the carrier relative to the second structure, caused by such a load on one of said structures, away from said intermediate set position in either direction along said line, and to return the carrier to said intermediate set position upon removal of said load.

4,524,486

SELF-LOCKING, SELF-ALIGNING STEPPED SPRING HINGE PIN

Victor Rios, Little Neck, and Henry W. Wolf, Malba, both of N.Y., assignors to Pivot Metal Works, Inc., Brooklyn, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,412
Int. Cl.³ E05D *5/12*
U.S. Cl. 16—381 **1 Claim**

1. A substantially rigid, self-aligning, self-locking spring hinge pin comprising,

(a) a leading section having a cylindrical section and a truncated section, the cylindrical section having a first diameter, said leading section tapering away from the cylindrical section to a rounded section, wherein the rounded section has a second diameter which is smaller than the first diameter, the truncated section has a taper which is angled to a longitudinal axis of the pin,

(b) a stepped mid-section having one end being directly connected to said cylindrical section, said stepped mid-section having a surface extending along the longitudinal axis,

(c) a stopping element being directly connected to the other end of the stepped mid-section, said stopping element having a radial dimension greater than that of the stepped mid-section, and

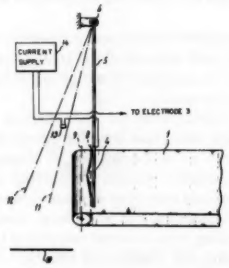
(d) a raised step is formed at the connection between said cylindrical section and the stepped mid-section, said step being inclined from the stepped mid-section toward the stopping element and away from the rounded section at an acute angle to the surface of said stepped mid-section to form a brim on the cylindrical section.

4,524,487

APPARATUS FOR THE AUTOMATIC STUNNING OF SLAUGHTER CATTLE

Jan B. R. Goossens, St. Lievens-Houtem, Belgium, assignor to Machinefabriek G.J. Nijhuis B.V., Winterswijk, Netherlands

Filed Jun. 11, 1982, Ser. No. 387,619
Int. Cl.³ A22B *3/00*
U.S. Cl. 17—1 E **14 Claims**



1. An apparatus for the automatic stunning of animals to be slaughtered, comprising:

two endless conveyors having their operative surfaces arranged with respect to each other such that a V-shaped passage is formed, the conveyors being parallel to each other, the conveyors being adapted to run synchronously; and,

two electrodes insulated with respect to each other and extending into the V-shaped passage from above, said electrodes being swingable about a horizontal transverse axis mounted above the conveyors, the electrodes being mounted upon a pendulum suspended from the transverse axis placed high above the position where an animal

would be located in the V-shaped passage during stunning, the electrodes having an initial position where the pendulum is positioned vertically in a transverse plane located closely in front of the transverse plane through the axes of reversing wheels of the conveyors at an outlet end of the conveyors so that the animal is permitted to drop from the conveyors to a receiving surface without moving the electrodes to a substantially displaced position, the electrodes being operative to engage the animal's head for stunning, the pendulum being long enough that the electrodes swing through an arc to a displaced position as the animal is carried by the conveyors such that vertical movement of the electrodes while engaging the animal's head is not substantial, the pendulum being operative to return to its initial position from said displaced position solely under the force of gravity.

4,524,488

APPARATUS FOR DISSECTING SLAUGHTERED ANIMALS

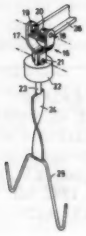
Andries J. E. van den Bogert, Hondsmesstraat 1, Hedel, Netherlands

Filed Aug. 23, 1982, Ser. No. 410,457

Claims priority, application Netherlands, Jan. 25, 1982, 8200252

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **12 Claims**



1. An apparatus for dissecting slaughtered animals comprising:

a conveyor adapted to transport a slaughtered animal along a transport path through plural treating stations;

a pair of spaced parallel rails extending along the transport path of said conveyor;

a lamellar element disposed and adapted for movement between said rails, said lamellar elements having a first end mounted to said conveyor to engage said rails to rotate said lamellar element for guiding said slaughtered animal along said conveyor in predetermined orientational positions through each of said plural treating staions;

a hook depending from a second end of said lamellar element for suspending the slaughtered animal;

motor driven knives positioned at each of said plural treating stations for cutting off particular parts of said slaughtered animal when said salughtered animal is positioned in each of said predetermined orientation positions;

said lamellar element including a twisted central portion and said pair of rails being disposed in a generally horizontal plane along the transport path of said conveyor except adjacent each of said plural treating stations wherein said pair of rails are disposed at an angular orientation relative said horizontal plane, so that transport of said lamellar element between said pair of rails along the transport path of said conveyor rotates said slaughtered animal about said lamellar element into each of said predetermined orientation positions.

4,524,489

DEVICE FOR SEPARATING AND PROCESSING THE GIZZARDS OF SLAUGHTERED POULTRY

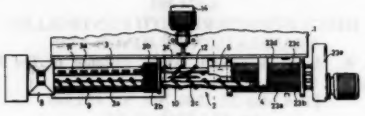
Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Netherlands

Division of Ser. No. 347,531, Feb. 10, 1982, Pat. No. 4,434,526. This application Feb. 29, 1984, Ser. No. 584,863

Claims priority, application Netherlands, Mar. 4, 1981, 8101055

Int. Cl.³ A22C *17/14, 21/00*

U.S. Cl. 17—11 **7 Claims**



1. A device for separating gizzards from the connected intestines of slaughtered poultry comprising a parallel pair of synchronously counter-rotating elongated cylindrical bar elements, a continuous helical ribbon for the conveyance of gizzards on one of said bar elements, plural circumferentially equidistantly spaced longitudinal rows of ribs on the other bar element, the ribs in the rows being adapted to enter into spaces between adjacent convolutions of said continuous helical ribbon, a pair of gizzard separating pinching roll elements on the downstream ends of said bar elements in coaxial relationship therewith and counter-rotating therewith, said pinching roll elements having engaging helical teeth of mutually opposite pitch on their peripheries, means to convey separated gizzards downstream from said pinching roll elements and to cut the gizzards lengthwise of the axes of the pinching roll elements, and means downstream from the last-named means to clean the interiors of the cut gizzards.

4,524,490

CRAWFISH PEELER

Randy Newville, 12102 Falcon St., Apt. D., Lafayette, La. 70506

Filed Oct. 6, 1983, Ser. No. 539,706

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—48 **4 Claims**

4. A method for removing intact meat from the tail of a crustacean, comprising the steps of:

a. removing the tail from the body of the crustacean;

b. providing a tong means attached to a handle, with an upper tong means having a portion with a convex cross section and a lower tong means having an opposing portion with a convex cross-section with a relatively large radius than that of the upper tong portion;

c. inserting tip sections of the upper and lower tongs between the meat within the crustacean tail and a shell of the tail;

d. inserting convex portions of the upper and lower tong means between the meat and shell of the tail, thereby breaking ligamentary points of attachment of the meat to the shell and straightening the shell;

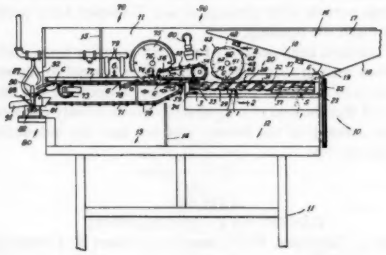
e. squeezing the tongs together, thereby gripping the meat between the tongs;

f. withdrawing the squeezed together tongs, forcibly removing thereby the meat from the tail of the crustacean, breaking the remaining tail attachment point at the nether end of the meat.

4,524,491
GIZZARD HARVESTING APPARATUS AND PROCESS

William J. Hill, Rte. 3, Box 230, Ball Ground, Ga. 30107; Carl J. Hill, deceased, late of Ball Ground, Ga., and by Hazel R. Hill, heiress, Rte. 3, Box 229, Ball Ground, Ga. 30107

Filed May 4, 1982, Ser. No. 374,771
Int. Cl.[3] A22C *21/00*
U.S. Cl. 17—52 42 Claims



1. In the processing of gizzards from poultry using a gizzard processing apparatus, the improvement for feeding and positioning the gizzards for slitting comprising the steps of:

detaching the gizzards from the poultry with portions including the stomachs attached and directing the gizzards and portions toward a processing station;

applying an initial orienting force to each gizzard at the processing station through the attached portions to move the gizzard into an initial predetermined orientation;

applying a second orienting force directly to each gizzard while maintaining said first force applied to said attached portions to thereby move the gizzard into a second predetermined orientation relative to and while maintaining said initial orientation so that said first and second forces cooperate to orient the gizzard into a selected position in preparation for further processing;

securing each gizzard in said selected position; and

thereafter removing said portions including the stomach from the gizzard.

11. In a poultry gizzard harvesting apparatus the improvement comprising a feeding and aligning station for processing a plurality of gizzards having portions including the stomach attached, said station comprising:

means for directing a plurality of said gizzards to said station in a random arrangement;

feed roll means for engaging the attached portions of each of said gizzards to apply an initial orienting force to each gizzard which moves the gizzards from a random arrangement into an initial predetermined orientation, said feed roll means being further adapted to transport each gizzard within said station;

orienting means adjacent to and independent of said feed roll means and adapted to engage each gizzard and apply a second orienting force thereto while the feed roll means maintains said first orienting force and moves the gizzards in said station to thereby move the gizzard into a second predetermined orientation relative to and while maintaining said initial orientation, said orienting means and feed roll means cooperating to orient each gizzard into a preselected position within said station in preparation for further processing;

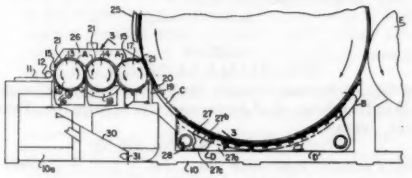
means for securing each gizzard in said preselected position; and

means for removing said portions including the stomach from each gizzard after each gizzard is secured in said preselected position.

4,524,492
CARDING APPARATUS AND METHOD

Olin S. Elliott, P.O. Box 8675, Greenville, S.C. 29604

Filed Dec. 23, 1982, Ser. No. 452,745
Int. Cl.[3] D01G *15/42, 15/76*
U.S. Cl. 19—107 9 Claims



1. In a carding machine having a plurality of lickerin rolls and a cylinder receiving opened fibers from said lickerin rolls, the improvement including:

a card screen extending partially about said cylinder;

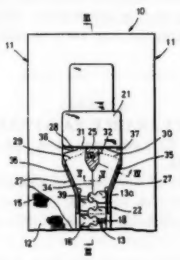
said card screen having spaced sides and a bottom defining a plurality of circumferentially spaced transverse slots thereacross for relieving air currents generated by the action of said cylinder during carding; and

an air suction plenum extending substantially thereacross and circumferentially of said screen for relieving pressure generated by said air currents through a plurality of said spaced transverse slots.

4,524,493
WATERTIGHT SLIDE FASTENER

Akio Inamura, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,519
Claims priority, application Japan, May 26, 1982, 57-77258[U]
Int. Cl.[3] A44B *19/32*
U.S. Cl. 24—389 9 Claims



1. A watertight slide fastener comprising:

(a) a pair of rows of coupling elements mounted on a pair of opposed waterproof stringer tapes along their respective inner longitudinal edges;

(b) a slider having a slider body including a pair of spaced wings joined at their front end by a neck so as to define therebetween a Y-shaped guide channel for the passage therethrough of said rows of coupling elements, each said wing having a pair of side flanges jointly defining a portion of said Y-shaped guide channel; and

(c) a resilient bifurcated seal member mounted on said stringer tapes adjacent to one end of said rows of coupling elements and snugly receivable in said Y-shaped guide channel, said seal member having a pair of resilient tongues, respectively, extending from said one end of said rows of coupling elements along said longitudinal tape

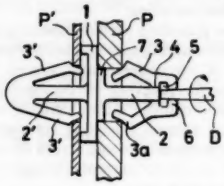
edges and a head interconnecting said tongues at their upper end so as to define therebetween a first slot facing toward said one end of said rows of coupling elements and snugly, sealingly receptive of said neck of said slider body, said tongues having outer sidewalls sealingly engageable with said side flanges of said slider body and opposed inner sidewalls sealingly engageable together when said slider is in its uppermost position.

4,524,494

DETACHABLE FASTENER

Youji Sato, Yokohama; Nobuaki Omata, and Sakuzo Shimbara, both of Hiroshima, all of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Jul. 5, 1983, Ser. No. 510,509
Claims priority, application Japan, Jul. 5, 1982, 57-115550
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—453 **10 Claims**



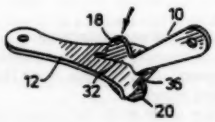
1. A one-piece plastic detachable fastener comprising a central shank provided at one end thereof with a head portion, a pair of elongated diverging leg pieces resiliently connected intermediate their extremities through respective hinges to the other end of said central shank, the diverging ends of said legs forming the trailing ends while the opposite ends form the leading ends, said leading ends extending beyond said other end of said shank and being spaced from each other, and a receiving part adapted to receive an external spreading force and formed as flange means connected to the leading ends of said pair of leg pieces, whereby said receiving part on receiving said external spreading force bends said leg pieces about said hinges and brings the free ends of said pair of leg pieces toward each other.

4,524,495

SEPARABLE FASTENER

Herman A. Hess, 10 Eddystone Ave., Downsview, Ontario, Canada M3H 1H4

Continuation-in-part of Ser. No. 513,825, Jul. 15, 1983,. This application Oct. 21, 1983, Ser. No. 544,226
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—590 **6 Claims**



1. A separable fastener comprising:

a male member having a stem portion and a T-shaped head portion with two arms projecting sidewards from the stem portion,

and a female member constituted by an elongated body with a tail portion and a forward portion that is bent with respect to the tail portion, the elongated body having an opening therethrough adjacent the bent forward portion, the opening being of sufficient length to permit insertion of one arm of said T-shaped head portion of the male member, said bent forward portion of the female member terminating at an edge which interferes with complete passage of the T-shaped head portion through the opening in any but one particular orientation of the male member with respect to the female member, said edge having an indentation adapted to receive the T-shaped head portion when in said one particular orientation in order to avoid interference and permit complete passage of the T-shaped head portion through the opening, the opening further having a part wide enough to permit swivelling of the stem portion after passage of the T-shaped head portion through the opening,

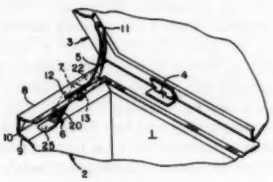
the T-shaped head portion of the male member being curved when seen in section taken in a plane normal to the main extent of said stem portion, thereby to decrease the likelihood that the said two arms will simultaneously register in the opening of the female member and the indentation, respectively.

4,524,496

CASKET STAY MECHANISM

Tehmtan J. Tehsildar, West Lawn, and Robert R. Colbert, Lititz, both of Pa., assignors to Boyertown Casket Company, Boyertown, Pa.

Filed Dec. 13, 1982, Ser. No. 449,305
Int. Cl.³ A61G *17/00*; F16C *11/00*; F24H *3/00*
U.S. Cl. 27—18 **11 Claims**



1. A stay mechanism for a first member hingedly connected to a second member for relative movement of the members between first and second positions, the stay mechanism yieldably retaining said members in the second of said positions, said mechanism comprising:

an arm pivotally attached at one end to the first member at a point on the first member offset from the hinged connection, and having a sidewise protrusion at its other end;

a guide means on the second member for guiding the protrusion into and out of the second position, said guide means comprising a resilient strip secured at one end to said second member and having a resilient pocket shaped to receive the protrusion, said pocket being adjacent said one end of the resilient strip, said guide means further comprising a camming surface fixed with respect to the second member, said camming surface facing the open pocket, said resilient strip having a portion inclined away from the pocket and the camming surface, said inclined portion serving to guide the protrusion towards the pocket as the members are moved towards the second position, the camming surface being spaced relative to the pocket to define an entrance to the pocket which is expanded by yieldable movement of the pocket in an interaction of forces between the protrusion, the pocket and the camming surface, as the protrusion enters and leaves the pocket and as the members are moved into and out of the second position, said pocket and the camming surface yieldably retaining the protrusion within the pocket when the members are in the second position, the end of the strip remote from the pocket being free for limited movement during said yieldable movement of the pocket.

4,524,497

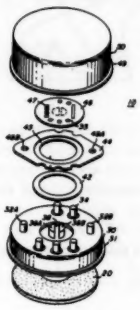
METHOD OF MAKING A LOW-PROFILE CRYSTAL PACKAGE WITH AN IMPROVED CRYSTAL-MOUNTING ARRANGEMENT

Gary M. Rapps, Sunrise, and Alvin Feder, Lauderhill, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 377,289, May 12, 1982, Pat. No. 4,453,104. This application Feb. 15, 1984, Ser. No. 565,438

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **4 Claims**



1. A method of mounting and making electrical wire connections to a multi-electrode crystal wafer, comprising the steps of:

providing a base member with an upstanding support post and a plurality of spaced terminal elements and locating pins thereon;

placing a ring of conductive material, which is conducive to melting and of a predetermined thickness, on said base member overlying said support post;

placing said crystal wafer on a carrier member, having an aperture less than the diameter of said crystal wafer so as to support an edge portion thereof;

placing a small amount of conductive paste material to the top surface of said support post;

placing said carrier member with said crystal wafer on said base member in a manner keyed to said locating pins and resting on said ring of conductive material whereby the crystal wafer is unsupported by the support post of said base member;

making wire bonds from the crystal electrodes to the respective base member terminal elements while the edge of said crystal wafer is fully supported; and

temporarily applying downward pressure to the top of said carrier member and raising the ambient temperature to a level to melt the ring of conductive material whereby said carrier moves downwardly and said crystal wafer is fastened and supported solely on said support post.

4,524,498

METHOD AND APPARATUS FOR MODIFYING THE COMBUSTION CHAMBER OF AN ENGINE TO ACCEPT CERAMIC LINERS

Dale L. Hartsock, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02040, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983

PCT Filed Dec. 27, 1983, Ser. No. 589,936

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—156.4 WL **22 Claims**

1. A method of modifying a conventional internal combustion engine to accept ceramic, said engine having an engine block with a wall defining a bore opening, an engine head, and a piston in said bore opening, the piston having a top and sealing rings which together cooperate with the engine block and head to define a combustion chamber, comprising:

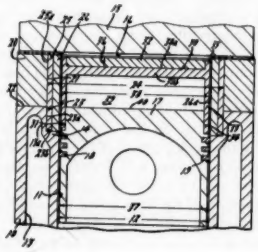
(a) joining an extension member to said engine block, said extension member having a wall defining a bore opening aligned with but larger than the bore opening of the engine block;

(b) enlarging the diameter of the upper portion of said wall in the engine block defining a bore opening to form an annular shoulder with a radially outer surface substantially axially aligned with said wall of the extension member defining a bore opening;

(c) securing a cylindrical ceramic liner commonly along both said wall of the extension member and the radially outer surface of said shoulder in said block, said liner being comprised of a material having a coefficient of thermal expansion differing from the coefficient of thermal expansion of the block by up to 2.0×10^{-6} in/in/°F.; and

(d) attaching a cap to the top of the piston to extend the effective piston top a distance commensurate with the effective height of the extension member.

16. A conventional engine apparatus modified to accept ceramic facing material, comprising:



(a) an engine housing have a block with a wall defining a bore opening, an engine head, and a piston in the bore opening, the piston having a top and sealing rings cooperating to define a combustion chamber with said block and head, said block wall having an annular groove at its upper end enlarging said bore opening, said groove defining a radially outer cylindrical surface;

(b) an extension member joined to said block having a wall defining a bore opening aligned axially with but larger than the bore opening of the block, said extension member wall being substantially axially aligned with said radially inner cylindrical surface of said bore opening of said block;

(c) a ceramic liner secured along said wall of the extension member and along said radially outer cylindrical surface of said block, said liner being comprised of a material having a coefficient of thermal expansion differing from the coefficient of thermal expansion of the block by up to about 2.0×10^{-6} in/in/°F.; and

(d) a cap attached to said piston to extend the effective piston top a distance commensurate with the effective height of the extension member.

4,524,499

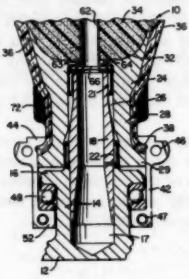
METHOD OF FABRICATING AN AIRCRAFT PROPELLER ASSEMBLY WITH COMPOSITE BLADES

Richard V. Grimes; W. Benjamin Harlamert, both of Piqua, Ohio, and David F. Thompson, Prospect Park, Pa., assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 321,771, Nov. 16, 1981, Pat. No. 4,407,635, and a continuation of Ser. No. 1,961, Jan. 8, 1979, Pat. No. 4,302,155. This application Apr. 11, 1983, Ser. No. 483,732

Int. Cl.³ B21K *3/04*; B23P *15/04*

U.S. Cl. 29—156.8 B **12 Claims**



1. A method of making an aircraft propeller assembly having a rotatable propeller hub supporting a plurality of radially extending composite propeller blades, comprising the steps of forming an elongated core of substantially rigid material for each of the composite blades, surrounding the core of each blade with a skin of plastic resin impregnated material, supporting the core of each blade with a rigid base member having an outwardly projecting inner flange portion integrally connected to a neck portion of reduced outside diameter, continuing the skin material on the core of each blade radially inwardly along the neck portion of the corresponding base member in overlying relation and forming an annular skin flange portion projecting laterally outwardly and radially overlying the flange portion of the base member, securing the skin material surrounding the reduced neck portion of each blade to the neck portion with securing means located radially outwardly from the skin flange portion of the corresponding blade for forming a first rigid connection of the skin material to the base member, providing the propeller hub with means forming an inwardly projection annular lip portion substantially surrounding the base member of each blade, positioning the annular lip portion of each blade radially outwardly of the corresponding skin flange portion and around the skin material of the blade, and retaining the annular skin flange portion of each blade with the corresponding radially overlying annular lip portion of the propeller hub to form a second rigid connection of the skin material to the base member of each blade.

4,524,500

PROCESS FOR CONVERTING A CERAMIC TOILET COMMODE INTENDED TO BE SUPPLIED WITH AN INDEPENDENT WATER SUPPLY PIPE INTO A TOILET COMMODE ADAPTED TO BE SUPPLIED WITH WATER BY AN ASSOCIATED TANK

Michel Genetay, and Gérard Dangers, both of Selles-sur-Cher, France, assignors to Societe Anonyme des Produits Ceramiques de Touraine, Selles-sur-Cher, France

Filed Mar. 17, 1983, Ser. No. 476,375

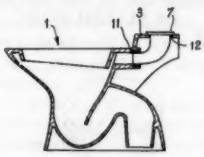
Claims priority, application France, Mar. 24, 1982, 82 04994

Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*

U.S. Cl. 29—157 R **6 Claims**

1. A process for converting a ceramic toilet commode intended to be supplied with water by way of an independent water supply pipe and comprising a rear cylindrical receiving cavity for the water supply pipe and a horizontal platform vertically above the rear of the receiving cavity, into a toilet commode intended to be supplied with water by an adjoining cistern, said process comprising:

boring in said platform a central aperture having a diameter exceeding the diameter of said cavity;



inserting into said bored aperture an elbow pipe element which has adjacent to one of its ends a flange applied against the edge of said aperture and which has a diameter decreasing in a direction toward the other end of said elbow pipe element; and

inserting said smaller other end of said elbow pipe into said receiving cavity of said toilet commode.

4,524,501

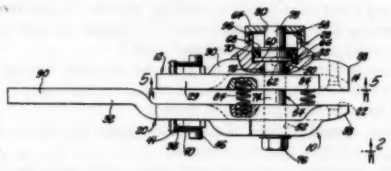
APPARATUS FOR JOINING FLARED ENDED TUBES

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1982, Ser. No. 363,958

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—237 **20 Claims**



1. An apparatus (10) for joining two tubes (16,24), each having flared ends (96) with a first of the tubes (16) having a ferrule (18) with a frustoconical portion (102) engaging the outside of the flared end (96) thereof and a cylindrical portion (26) extending therefrom to be crimped over the outside of the flared end of the second tube (24), said apparatus (10) comprising; first tube support means (12) having a pocket (14) for receiving the first tube (16) with the ferrule (18) disposed thereon, second tube support means (20) having a pocket (22) for receiving the second tube (24), actuator means (28) for moving said first and second tube support means (12,20) between an open position for receiving the first and second tubes (16,24) in said pockets (14,22) and a closed position to crimp the cylindrical portion (28) of the ferrule (18) over the outside of the flared end (96) of the second tube (24), and at least one of said first and second tube support means (12,20) being defined by a pair of arms (29,30,32,34) pivotally connected together along their respective lengths for scissor-like movement between a receiving position opening said pocket (14,22) therein and a retaining position closing said pocket (14,22) therein, said assembly including locking means for locking said arms (29,30,32,34) in said retaining position, said locking means including a hook member (36) mounted for pivotal movement on one side of said arms (30,32) and a pin (38) projecting from the other of said arms (29,34), said hook member (36) removably engaging said pin (38) for locking said arms (29,30,32,34) in said retaining position.

4,524,502

TONGS FOR INSERTING A CURTAIN-CARRYING SLIDING MEMBER INTO A PROFILED CURTAIN RAIL

Alfred Bachmann, 6, Sandackerweg, 3363 Oberoenz, Switzerland

Continuation-in-part of Ser. No. 284,220, filed as PCT CH80/00057 May 9, 1980, published as WO81/01360, May 28, 1981, §102(e) date Jul. 17, 1981, abandoned.
This application Aug. 29, 1983, Ser. No. 527,488
Claims priority, application Switzerland, Nov. 21, 1979, 10368/79
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—268 4 Claims

1. A tongs adapted for inserting a curtain-carrying glider member comprising a track part having a T-shaped profile and consisting essentially of an upright bar portion, a cross bar portion to the center of the underside of which the upper end of said upright bar portion is attached, and a ring part having a ring opening and depending from the lower end of said upright bar portion, into a curtain rail having a longitudinal extending opening in the bottom part thereof and shoulders of said rail bottom part to the right and to the left of said bottom opening, in such a manner that said cross bar portion of said glider member rests upon the shoulders of said rail bottom part, and the upright bar portion of said glider member track part extends downwardly through said rail bottom opening and protrudes with its lower end from the underside thereof, said ring part being located below said rail,

which tongs comprise two tong arms having arm ends, one of said arm ends having an inward arm face turned toward an opposite inward arm face of the other arm end, said arm ends being adapted for engaging between them said glider member,

each of said arm ends having a recess open at the top and having a bottom contact face extending transversely to and above the inward arm face of that arm end, and a recess sidewall about said bottom contact face on three sides thereof, said sidewall being open on the side thereof located above the inward face of that arm end,

whereby, when said lower end of said upright bar portion of said glider member rests on said bottom contact faces of said recesses in said arm ends, extending through the open sides of said recess sidewalls, and said glider member ring part extends between the opposite inward faces of said arm ends underneath said recesses, said glider member is held between said arm ends, upon closing of said tongs; and

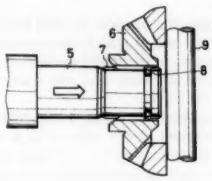
each of said arm ends comprises elongated centering means protruding from the face of said arm end turned toward the opposite face of the other arm end, centrally below said open side of said sidewall and below the flat bottom face of said recess, whereby, when said glider member is in said position between said arm ends of the tongs closed thereon, said centering means are located with their free ends in said ring opening of said ring part.

4,524,503

METHOD AND APPARATUS FOR HYDRAULICALLY ASSEMBLING A DRIVEN SHAFT AND A DRIVE MEMBER

Hideo Nakamata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 20, 1983, Ser. No. 459,597
Claims priority, application Japan, Jan. 20, 1982, 57-7205
Int. Cl.³ B23Q *17/00*
U.S. Cl. 29—407 8 Claims



1. A method for inserting an end of a driven shaft having a snap ring disposed in a circumferential groove adjacent to said end into a mating opening in a driving member, the method including aligning the end of the driven shaft with the inlet to the opening of the driving member, pressing the end of the driven shaft into the opening of the driving member by means of a hydraulic actuator until the snap ring engages a groove provided inside the opening of the driving member, and detecting a stroke position of the actuator corresponding to the fully inserted state of the driven shaft, wherein the improvement comprises: measuring the supply pressure to the hydraulic actuator during the press-in operation;

providing a first indication if the supply pressure rises when the fully inserted state of the driven shaft is detected; and

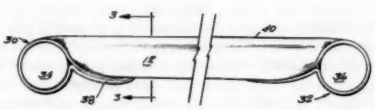
providing a second indication if the supply pressure rises when the fully inserted state of the driven shaft is not detected, whereby information as to the supply pressure of the hydraulic actuator is combined with the information as to the stroke of the hydraulic actuator to determine whether or not the driven shaft is normally fitted into the driving member.

4,524,504

METHOD OF REPLACING WORN AND/OR DAMAGED SURFACES

Clayton J. Hemmerle, 116 NE. 16th Ct., Ft. Lauderdale, Fla. 33305, and Richard A. Basinger, 6318 SW. 26th St., Miramar, Fla. 33023

Division of Ser. No. 352,102, Feb. 25, 1982, Pat. No. 4,438,800.
This application Sep. 13, 1983, Ser. No. 531,647
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—450 5 Claims



1. A method for replacing at least a portion of a worn and/or damaged surface on an article of furniture having a frame which includes at least a pair of opposing generally parallel spaced frame members, said surface adapted to supporting at least a portion of a person's weight thereon, said method comprising the steps of:

(a) selecting a slat comprising support means for supporting a load placed thereon having generally opposing ends, each of said ends including attachment means defining a closed cavity for receiving a portion of one of said frame members, and biasing means for providing a bias force thereby biasing said attachment means in a normal substantially closed position and for allowing access to said cavity upon application of a force in a direction generally opposing the bias force;

(b) applying a force to said attachment means at one end of said slat in a direction generally opposing the bias force of said biasing means thereby opening and providing access to the cavity;

(c) then positioning the opened one end around a portion of a predetermined one of said frame members so that said attachment means substantially surrounds said one frame member thereby allowing said one frame member to be accepted by said cavity;

(d) then releasing the force applied according to step (b) so that said attachment means returns to a normal substantially closed position thereby securing said one end in position; and repeating steps (b)–(d) utilizing the other end of said ends and the other one of said opposing frame members.

4. A method of replacing at least a portion of a worn and/or damaged surface bridging a pair of opposing separated surface support members said method comprising the steps of:

(a) selecting a surface-defining member of the type including opposing ends each having an attachment means defining a closed cavity for receiving a portion of one of said support members therein, and biasing means for providing a bias force to bias said attachment means into a normal substantially closed position and for allowing access to said cavity upon application of a force in a direction generally opposing said bias force;

(b) applying a force to the attachment means at one end of said surface-defining member in a direction generally opposing the bias force of the biasing means to open the attachment means thereby providing access to the cavity;

(c) then positioning the one end having its respective attachment means opened according to step (b) so that a predetermined one of the pair of surface support members is accepted into the cavity;

(d) then releasing the force applied according to step (b) to permit the attachment means to assume the normal closed position around said one of the pair of surface support members; and repeating steps (b)–(d) utilizing the other one of said ends and the other one of said pair of surface support members.

4,524,505

METHOD OF ASSEMBLING A PIPE JOINT

Randall C. Conner, Birmingham, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Division of Ser. No. 242,925, Mar. 12, 1981, Pat. No. 4,428,604. This application Nov. 1, 1983, Ser. No. 547,680

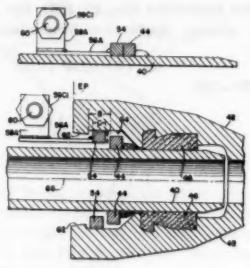
Int. Cl.³ B23P *11/02*

U.S. Cl. 29—453 **14 Claims**

8. A method of assembling a pipe joint having a first pipe with a cylindrical socket, said cylindrical socket having a radially inward retaining lip adjacent a retaining groove; a second pipe with a cylindrical spigot, said cylindrical spigot having an outwardly projecting portion; a ring assembly including a bearing ring having two ends at a split, said bearing ring uniquely defining a plane, two transverse pieces, each transverse piece attached to one end of said bearing ring and extending away and outside from the plane defined by said bearing ring, a threaded rod mounted to extend between said two transverse pieces, a first closure nut on said threaded rod, said first closure nut operable to contract the diameter of said bearing ring; the steps comprising:

(a) contracting said bearing ring around said spigot adjacent to said outwardly projecting portion by adjusting said first closure nut to bring said transverse pieces closer together and to lie on an outer surface of said spigot, each of said transverse pieces touching said outer surface along its entire length;

(b) positioning said spigot and said contracted bearing ring within said socket, said transverse pieces extending out from said socket;



(c) loosening said bearing ring from said spigot such that the natural resilience of said bearing ring expands it to seat within said retaining groove to lock said pipe joint against axial separation by said bearing ring bearing between said retaining lip and said outwardly projecting portion.

4,524,506

METHOD FOR ATTACHING AN ARTICLE TO A WALL

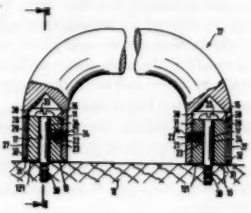
Rudolf Wilke, Marsberger Strasse 2, 3548 Arolsen, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,574

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105347

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—453 **5 Claims**



1. A method of attaching an article with one or more holders to a wall, the holder having a wall contact surface provided with a covered, self-adhesive layer and an aperture adapted to receive a member for mechanically connecting the holder to the wall, the method comprising steps of:

provisionally securing at least one holder to an article in the holder's intended permanent position on the article;

baring the covered, self-adhesive layer provided on the wall contact surface of the holder;

aligning the article carrying the provisionally secured holder in a predetermined position on the wall;

adhering the self-adhesive layer of the holder to the wall;

removing the aritcle from the holder such that the holder remains adhered to the wall in a position determined by the aligning and adhering steps;

drilling an attachment hole for the holder through the aperture into the wall by using each holder as a drilling jig;

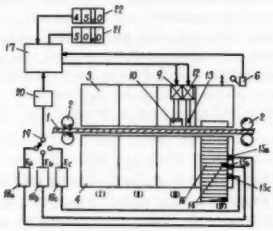
attaching each holder to the wall with a mechanical fastening member extending through the aperture; and

resecuring the article to each holder; whereby the article is firmly secured in the predetermined position on the wall.

4,524,507
LAMINATED CORE PRODUCING APPARATUS

Yoshihumi Hara, Hirakata; Hiroji Takano, Yawata; Shoshi Kabashima, Hirakata, and Mikio Hasegawa, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP81/00072, § 371 Date Nov. 30, 1982, § 102(e) Date Nov. 30, 1982, PCT Pub. No. WO82/03491, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 31, 1981, Ser. No. 451,209
Int. Cl.³ B23Q *15/00*
U.S. Cl. 29—564.2 **4 Claims**



1. A laminated core product producing apparatus wherein a projection is formed on part of a strip of core sheet material and core sheets with said projection are punched out of the strip and assembled in a linearly moving stack into the laminated core product by making use of the mutual fitting and crimping of the projections on the core sheets, the thickness of the laminated core product in the direction of the thickness of the core sheets being determined by controlling the intermittent punching out of said projections, said apparatus comprising:

a marking mechanism for selectively marking a portion of the lateral side edge of a core sheet to be punched out;

at least one proximity sensor provided adjacent the stacked core sheets being assembled into the core product for producing a signal corresponding to the distance of a marked core sheet from the head of the stack during movement of the marked core sheet along the stack;

means for generating a timing signal each time said core product producing apparatus punches out one core sheet and assembles it on the stack;

means for presetting the target value of the thickness of the core product in the direction of the thickness of the laminations;

memory means for storing information about the distance of said proximity sensor from the head of the stack;

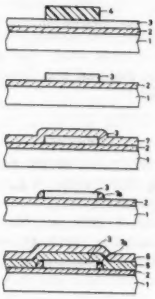
an intermittent projection punching mechanism capable of being electrically controlled for forming or not forming the projection; and

a control device connected to said timing signal generating means, said proximity sensor, said memory means and said target value presetting means and having an output connected to said intermittent punching mechanism for, using the count of said timing signals after actuating of said marking mechanism as being the number of sheets in the assembly of core sheets, calculating the thickness of the assembly of core sheets from the information provided by the proximity sensor detecting said marked core sheet and from the information about the distance of said proximity sensor from the head of the stack and dividing by the number of sheets counted to find the average thickness of one core sheet and adding the value of such average thickness for the number of core sheets to provide a cumulative value for each said timing signal and providing an output signal for controlling the operation of said punching mechanism when said cumulative value excceds said target value.

4,524,508
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Shinichi Sato, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 517,984
Claims priority, application Japan, Aug. 25, 1982, 57-148701
Int. Cl.³ H01L *21/22, 21/306*
U.S. Cl. 29—571 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a first conductive layer (3) over a semiconductor substrate (1),

masking a predetermined pattern on said first conductive layer (3) and then physically etching said first conductive layer (3) to provide side surfaces of said predetermined pattern substantially perpendicular to the surface of the said semiconductor substrate (1),

forming a first insulating layer (7) over the surface of said semiconductor substrate (1) and directly on said first conductive layer (3) after removal of the mask on said predetermined pattern,

physically etching said first insulating layer (7) until said first conductive layer is exposed in said first insulating layer (7) formed over said semiconductor substrate (1), so that a portion of said first insulating layer (*7a*) is left in a stepped portion at the side surfaces of said first conductive layer (3),

forming a second insulating layer (5) over the surface of said semiconductor substrate (1) and on said left portion of said first insulating layer (*7a*) and on said first conductive layer (3) etched to the predetermined pattern, and

forming a second conductive layer (6) over a whole upper surface of said second insulating layer (5).

4,524,509
ENVELOPING A BATTERY PLATE BY A DIP PROCESS AND PRODUCT PRODUCED THEREBY

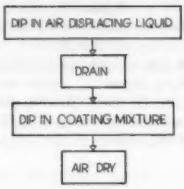
Paul C. Wegner, San Carlos, Calif., assignor to Tiegel Manufacturing Co., Belmont, Calif.

Continuation-in-part of Ser. No. 482,874, Apr. 7, 1983, abandoned, which is a continuation of Ser. No. 253,283, Apr. 13, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,475
Int. Cl.³ H01M *2/18*
U.S. Cl. 29—623.5 **18 Claims**

1. A dip method of enveloping a battery plate with a commercially acceptable separator material, comprising the steps of:

(a) displacing the air from the plate by dipping in a first liquid;

(b) then dipping the plate in a second liquid comprising a polymer dissolved in a solvent/nonsolvent mixture and a filler in suspension; and then



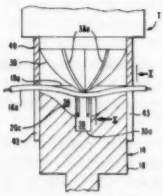
(c) removing the plate and allowing the solvent/nonsolvent to evaporate and form, about said plate, an envelope of porous separator material free from commercially unacceptable pinholes.

4,524,510

METHOD OF MAKING WIRE TERMINATIONS

Edward P. Brandeau, Martinsville, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 7, 1982, Ser. No. 447,592
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—861 **6 Claims**



1. A method of reliably terminating fine insulated wires on very close centers comprising: providing a plurality of contact devices having upper faces each with a plurality of radially extending wire receiving slots, indexing a wire relative to the end of a stuffing tool, indexing the tool laterally on a contact device and vertically thereagainst with the wire lying across the upper face of the device, radially indexing the wire relative to a selected slot to seat the wire in the top of the slot, progressively forcing the wire into the slot deeper near the center of the device than at the outer edge, the wire being inserted sufficiently deep near the center to skive away the insulation along the sides of the wire conductor, and forcibly seating the wire with a portion of the wire insulation tightly compacted between the bottom of the wire conductor and a bottom wall of the slot, the wire conductor being substantially deformed and wedged tightly in the slot.

4,524,511

ADJUSTABLE INTERIOR PIPE CUTTER

Richard Montiero, Lake Worth, Fla., assignor to Remcut International Inc., Fort Lee, N.J.

Continuation of Ser. No. 470,057, Feb. 28, 1983, Pat. No. 4,466,185. This application Jul. 18, 1984, Ser. No. 631,994
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.³ B23D *21/14*
U.S. Cl. 30—108 **2 Claims**

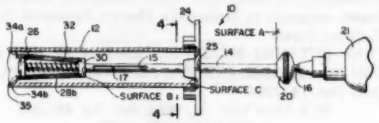
1. A pipe cutter for cutting pipe from the inside out which comprises:

(a) two pivoted sliding guides having guides;

(b) a guide pivot post wherein a first end of two pivoted sliding guides are pivoted mounted;

(c) a cutter for cutting the inside of the pipe fixed to the end of each pivoted sliding guide and being generally perpendicular to the pipe to be cut;

(d) a driving slide member that slides within the guides of the pivoted sliding guide and imparts to the pivoted sliding guides a rotational force so that the cutters will have the necessary force to cut into the pipe;



(e) a drive shaft that has a first end firmly attached to said driving slide member and a second end whereby a driving force may be exerted;

(f) a draw bar that has an aperture through its center whereby said drive shaft is inserted, said draw bar rotatably attached to said driving slide member;

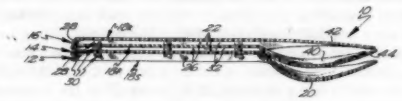
(g) a spacer bar having an aperture through its center whereby said spacer bar is inserted over said draw bar.

4,524,512

NESTABLE, STACKABLE CUTLERY

Jerome L. Formo, St. Paul, Minn.; Albert C. Lasher, New York, N.Y., and Robert W. White, Oklahoma City, Okla., assignors to O Tray Corporation, Oklahoma City, Okla.

Filed Apr. 25, 1983, Ser. No. 488,564
Int. Cl.³ A47J *43/28, 45/06*
U.S. Cl. 30—147 **15 Claims**



1. Nestable, stackable cutlery comprising, in combination: a spoon having a handle portion and a bowl portion; a fork having a handle portion and a tine portion; a knife having a handle portion and a blade portion, with the handle portions of the spoon, fork, and knife having a substantially identical construction, with the handle portions of the spoon, fork, and knife including a generally U-shaped cross section comprising, in combination: a flat top portion having a first end, a second end, a first edge, a second edge, an outside surface, and an inside surface; and first and second leg portions, with the first and second leg portions including a first end, a second end, a first edge, a second edge, an outside surface, and an inside surface, with the first edge of the first leg portion being attached at an obtuse angle to the first edge of the top portion and with the first edge of the second leg portion being attached at an obtuse angle to the second edge of the top portion, with the distance between the second edges of the first and second leg portions being greater than the distance between the first and second edges of the top portion allowing the handle portions of the spoon, fork, and knife to be stacked and nested together, with the handle portions further including means for supporting the handle portion along its entire length on the handle portion of another piece of cutlery in the their stacked, nested positions comprising lugs formed on the inside surfaces of the first and second leg portions for abutting with and support on the outside surface of the top portion of the handle portion of the other piece of cutlery, with the lugs being wedge shaped and including an inside surface and an abutment surface, with the abutment surface having a shape complementary to and for abutment with the outside surfaces of the top portion and the first and second leg portions at their intersections, and wherein the inside surface of the lugs extend at an angle less than 90° from the top portion of the handle portion to form an inverse taper for holding onto the punch of an injection mold during

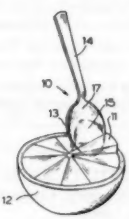
formation of the cutlery, with the bowl portion of the spoon being attached to the second ends of the top portion and the first and second leg portions of the handle portion and being of an elongated oval shape having a length, a width, and a depth, with the tine portion of the fork being attached to the second ends of the top portion and the first and second leg portions of the handle portion and having a length, a width, and a depth equal to the length, the width, and the depth of the bowl portion of the spoon, with the tine portion of the fork including a first tine, a second tine, and a third tine, with the first and third tines being located on opposite sides of the second tine, with the first and third tines being shorter than the second tine allowing the tine portion of the fork to remain in the outline of the bowl portion of the spoon for protecting the tines against breakage due to catching on external objects and for preventing the tines from poking through the packaging in which the cutlery is located when the fork is stacked on top of the spoon, with the blade portion of the knife being attached to the second ends of the top portion and the first and second leg portions of the handle portion and having a length generally equal to the length of the bowl portion of the spoon and tine portion of the fork, with the width of the blade portion of the knife being less than the width of the bowl portion of the spoon and the tine portion of the fork, with the blade portion having a shape which remains in the outline of the bowl portion of the spoon and the tine portion of the fork when the knife is stacked on top of the spoon or on top of the fork for preventing the blade portion from cutting through the packaging of the cutlery.

4,524,513

FLAT TIP SPOON

Anthony V. Intini, Jr., 3468 Whirlaway Dr., Northbrook, Ill. 60062

Filed Apr. 15, 1983, Ser. No. 485,403
Int. Cl.³ A47J *43/28*
U.S. Cl. 30—149 **14 Claims**



1. In a flatware or culinary spoon having a bowl with a front tip end portion and a rearwardly extending handle:

said tip end portion being flat and having a forwardly extending planar front edge;

the remainder of said bowl merging with said flat tip end portion and providing a receptacle for material directed thereinto by means of said flat tip end portion; and

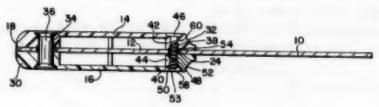
said bowl having upturned sides with side edges thereof merging with and terminating a substantial distance rearwardly from the forwardly extending edge of the flat tip end portion, so that sides of the flat tip end portion forwardly from the side edges of the bowl are unobstructed by the side edges of said bowl.

4,524,514

COMBINATION OF A TOOL AND A HOLLOW TOOL SECTIONAL HANDLE

David H. Mallalieu, Springfield; Samuel N. Apostola, Southbridge, and Douglas C. DeVries, Webster, all of Mass., assignors to Hyde Mfg. Co., Southbridge, Mass.

Filed Jun. 9, 1983, Ser. No. 502,558
Int. Cl.³ B25G *3/30, 3/32*
U.S. Cl. 30—169 **12 Claims**



1. The combination of a tool and hollow sectional handle, said tool comprising a blade with a flat elongated blade-like tang extending from said blade, said tang having two opposite broad flat faces along its length, two opposite longitudinal side edges and an end edge remote from said blade joining said pair of flat faces, said tang being indented along a major portion of said longitudinal side edges to form indented side edge portions, said tang having an intermediate portion bordered by said indented side edges and two broad opposite end portions joined by said intermediate portion, one of said two broad end portions merging with said tool blade and the other broad end portion being at the free end of said tang remote from said blade, and a pair of longitudinally spaced holes extending through said tang normal to said opposite flat faces,

said hollow sectional handle comprising two complementary mating elongated shell-like halves which are secured together with one-half contiguous to one of said flat tang faces and the other half contiguous to the other of said flat tang faces,

each handle half having an elongated main part and a rim about the main part,

the rim of each handle half having transversely spaced opposite longitudinal side rim portions with flat edge surfaces and opposite end rim portions with flat edge surfaces which are offset from the flat edge surfaces of the longitudinal side rim portion in the direction of said main part,

said handle halves having the flat faces of said opposite end rim portions pressed against the flat tang face to which the respective halves are contiguous in the area of said tang end portions and bordering same leaving the edges of said tang end portions exposed,

said opposite longitudinal side rim portions of one handle half facing and mating with the opposite longitudinal side rim portions of the other handle half, the mating longitudinal side rim portions on the opposite sides of said handle halves fitting within the indentations formed in the opposite longitudinal side edges of said tang and being contiguous to said indented side edge portions of said tang,

interlocking means on the opposite longitudinal side rim portions of the handle halves,

said interlocking means being in the form of projections and complementary mating holes,

each handle half further having two longitudinally spaced solid wall projections projecting from said main part,

said solid wall projections having end surfaces contiguous with one of the flat faces of the tang,

a bore in each of said solid wall projections, said solid wall projections being located in said handle halves so that the bores therein are longitudinally spaced and axially aligned with the two longitudinally spaced holes in said tang and are axially aligned with the longitudinally spaced bores of the mating handle half,

there being two pairs of axially aligned bores in said mating handle halves,

and fastener means in each pair of axially aligned bores in

said mating handle halves for securing said mating halves together with said tang sandwiched between them,

said opposite longitudinal side rim portions of said handle halves having ribs projecting laterally inwardly therefrom for reinforcing said side rim portions, said ribs providing supports for the handle tang.

4,524,515

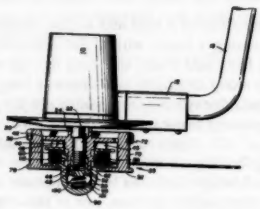
ROTARY CUTTING ASSEMBLY WITH FILAMENT FEED

Gary R. Oberg, Spirit Lake, Iowa, assignor to The Toro Company, Minneapolis, Minn.

Continuation of Ser. No. 733,286, Oct. 18, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,248

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **13 Claims**



1. A rotary cutting assembly comprising, in combination: a member rotatable about a drive axis, said member including a spool storage receptacle therein; a spool with a cutting line wound therearound, said spool located in said spool storage receptacle in either a first or a second axial location along said drive axis, said spool being rotatable with said member while in said first axial location and rotatable relative to said member and said drive axis when moved between said first axial location and said second axial location; spring means for urging said spool into said first axial location; ground engaging means for moving said spool against said spring means from said first axial location position to said second axial location when said ground engaging means is moved axially along the drive axis; and, indexing means for limiting rotation of said spool about said drive axis relative to said member when said spool is moved from said first axial location to said second axial location in response to the action of said ground engaging means to unwind a predetermined incremental length of cutting line from said spool.

4,524,516

MOLDED PLASTIC ARTICLE HAVING METALLIC INSERTS

Charles A. Wiechard, Tucker, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 191,628, Sep. 29, 1980, Pat. No. 4,354,995. This application Jul. 14, 1982, Ser. No. 398,452

Int. Cl.³ B26B *29/00;* **B32B** *15/08, 15/04*

U.S. Cl. 30—290 **4 Claims**

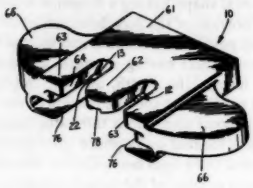
1. A tool which comprises a plastic portion and a metallic member, said tool comprising:

an insert assembly which comprises:

a metallic member; and

a locating framework which is made of a plastic material and which is molded about at least a portion of said metalic member to support said metallic member with a portion of said metallic member extending from said locating framework, said metallic member being positioned in a predetermined manner with respect to reference points of said framework; and

a housing which is made of a plastic material and which encloses said insert assembly, said reference points of said locating framework being positioned in a predetermined manner with respect to external surfaces of said housing to cause said metallic member to be positioned in a predetermined manner with respect to said housing



and to expose at least a surface of said portion of said metallic member which extends from said locating framework.

4,524,517

SANITARY TASTING SPOON

Iris A. Rupe, 3460 Eastside Calpella Rd., Ukiah, Calif. 95482

Filed May 31, 1983, Ser. No. 499,196

Int. Cl.³ A47J *43/28*

U.S. Cl. 30—324 **4 Claims**

1. In a spoon for the sanitary tasting of liquid food products having a bowl and handle connected thereto, the improvement comprising providing a baffle located substantially within the bowl and being characterized as emanating from an inner side wall of the bowl and extending away from the bowl at an angle to a line of geometric centers of the spoon and being further characterized as having an opening located proximate the edge of the baffle remote from the inner surface of the bowl.

4,524,518

UTILITY KNIFE

Robert F. West, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jun. 13, 1983, Ser. No. 503,749

Int. Cl.³ B26B *1/00*

U.S. Cl. 30—330 **18 Claims**

14. A knife holder for a utility knife employing a detachable blade of a type having a primary cutting edge and an opposite back edge, comprising:

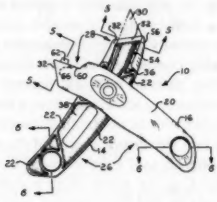
a pair of complementary opposing elongated body sections adapted for mating engagement along a parting line and having exterior surfaces forming a handle portion and a blade enclosure means to interiorly receive and at least partially enclose said detachable blade;

connecting means intermediate said blade enclosure means and handle portion to securely connect said body sections in a closed position;

said body sections cooperating in the closed position to

provide said blade enclosure means, said enclosure means terminating in the front tip of said sections to define a blade opening;

one of said body sections having an elongated shoulder projecting transversely across the parting line and extending rearwardly from said tip to form a blade canopy, said canopy shoulder having a first exterior surface generally conforming with the exterior surfaces of said sections when said holder is in the closed position, said canopy having a second interior surface generally opposite said first surface partially defining said blade enclosure portion



and being abuttable by the back edge of a blade received in said enclosure portion, and a slot on the opposite side of said parting line from said one body section so as to overlie said other body section in the closed position; and

the exterior surface of said other body section forming a recess complementary with said canopy shoulder for mating reception therewith, a freely projecting tongue extending outwardly from said recess forming exterior surface toward said shoulder for cooperative reception in said slot to interlock said body sections in close interfitting relationship.

4,524,519

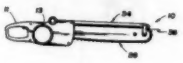
CONTINUOUS LOOP FLEXIBLE SAW

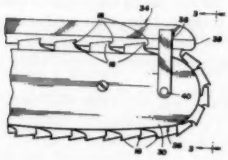
Anthony A. Muehling, 14583 Maddelein, Detroit, Mich. 48205

Filed Mar. 19, 1984, Ser. No. 590,918

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—382 **14 Claims**





1. A chain saw comprising:

a plurality of toothed cutting links forming a flexible continuous loop having upper and lower reaches and being arranged in two side-by-side rows with the links in a staggered relationship; the links of each row each having opposite ends respectively aligned with the opposite ends of a pair of adjacent links of the other row; pivotal connections that connect the aligned ends of the cutting links directly to each other; a guide bar on which the flexible loop is mounted, the links of each row of the saw each having a cutting tooth that extends away from the links of the other row to define a space that separates the teeth of the two rows of links, and a safety bar at least a portion of which is located in the space that separates the teeth of the two rows of links on the upper reach to provide protection against accidental cutting.

4,524,520

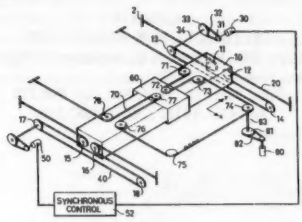
CARRIAGE POSITIONING SYSTEM

Nessim I. Levy, 13 Habrosh St., Savyon, Israel

Filed Feb. 24, 1983, Ser. No. 469,158

Int. Cl.³ G01D *15/16;* **F16H** *55/52*

U.S. Cl. 33—1 M **11 Claims**



1. A carriage positioning system for positioning a first carriage movable along a first axis with respect to a frame, and a second carriage carried by and movable with respect to said first carriage along a second axis perpendicular to said first axis; characterized in that said positioning system includes two flexible coupling elements each for coupling one of the opposite ends of said first carriage for movement with respect to the frame; each of said two flexible coupling elements having its opposite ends fixed to the frame on the opposite sides of the respective end of said first carriage and being trained over a pulley carried by said first carriage on each of the two opposite sides of the carriage, and over a further pulley carried by the frame on each of the two opposite sides of said first carriage; each of said two flexible coupling elements being coupled to a first member for driving same or for being driven thereby; said second carriage including a single flexible coupling element fixed at its two ends to said frame at one side of said two carriages; said single flexible coupling element being trained over two pulleys carried by each of said first carriage, a further pulley carried by each end of said second carriage between the associated last mentioned two pulleys, and a still further pulley carried by said frame at the side thereof opposite to that to which the two ends of the single flexible coupling element are fixed; said single flexible coupling element being coupled to a second member for driving same or for being driven thereby.

4,524,521

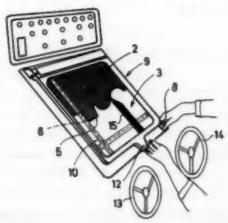
PROJECTION TABLE FOR AN OPTICAL PROJECTION PATTERN GRINDING MACHINE

Alfred Kolb, Haus am Tannenberg, D-6980 Wertheim, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,825

Int. Cl.³ G03B *23/00*

U.S. Cl. 33—1 AA **8 Claims**



1. Projection table of an optical projection form grinding

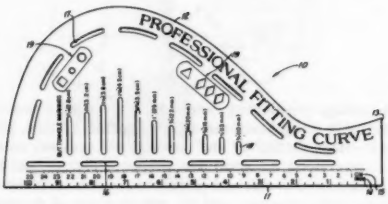
machine, comprising a transparent holder for a form pattern drawing, wherein said drawing bears insertion marks, and a transparent cover, wherein said cover can be moved between an open position in which the holder is accessible for insertion of the form pattern drawing, and a closed position, in which the cover lies flat on the form pattern drawing, and fixes it in position on the holder, and wherein said cover surface is made nonreflecting or reflection-reducing in the areas not above the insertion marks on the form pattern drawing.

4,524,522

FITTING CURVE AND RULER

Patricia Perry, Mt. Vernon, N.Y., assignor to Butterick Company, Inc., New York, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,219
Int. Cl.[3] A41H *1/00*; A42C *3/06*
U.S. Cl. 33—11 **7 Claims**



1. A fitting curve and rule to measure and mark patterns and fabric comprising:

a flat unitary panel member having first and second opposite side edges;

said first edge having a segment of a curve and said second edge being a straight edge;

ruler indicia on said panel along said straight edge;

a first series, in tandem, of elongated slots through said panel, parallel to said curve and spaced therefrom to locate a seam allowance;

a second series, in tandem, of elongated slots through said panel, parallel to said straight edge and spaced therefrom to locate a seam allowance;

a third series of slots through said panel to mark buttonhole lengths, the slots of said third series having different lengths; and

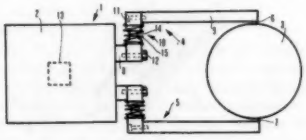
printed indicia on said panel associated with each of said third slots to indicate the length of each of said third slots.

4,524,523

PROBE FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

Guido Golinelli, Bologna, and Carlo Dall'Aglio, Volta Reno Di Argelato, both of Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Jul. 13, 1983, Ser. No. 513,309
Claims priority, application Italy, Mar. 25, 1983, 3379 A/83
Int. Cl.[3] G01B *7/02*
U.S. Cl. 33—143 L **18 Claims**



1. A probe for checking linear dimensions of mechanical pieces, comprising: a support; an arm movable with respect to the support and including a first element, a second element and a third intermediate element connected in a removable way to the first and second elements; a feeler fixed to the first element of the movable arm for contacting a piece to be checked; and detection means adapted for providing a signal responsive to the position of the movable arm; wherein said intermediate element includes a breakable section for protecting the probe from accidental impacts against the feeler and the first element of the movable arm, said section defining a geometrical axis located apart from the feeler and in a substantially different position with respect to the first element of the movable arm, for protecting the probe from blows striking along any direction.

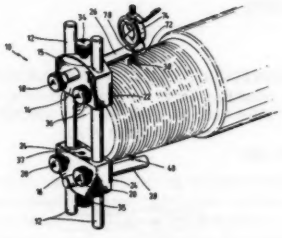
15. A probe for performing measurements on a piece, comprising: a casing; an arm movably coupled to the casing, said arm including a first element arranged outside the casing, a second element partially arranged within the casing and a third element removably connecting said first element to said second element, said first element and said second element defining substantially a common geometrical axis; a feeler fixed at a free end of said first element for contacting the piece; and detecting means for detecting the displacement of the arm from a reference position; wherein said third element includes a breakable section for protecting the probe from accidental impacts suffered by said feeler or said first element, said section defining a geometrical axis lying substantially in a position different from that of said common geometrical axis.

4,524,524

GAGE FOR MEASURING DIAMETERS

Jimmy I. Frank, and John R. Wolfe, III, both of Pasadena, Tex., assignors to Gagemaker, Inc., Pasadena, Tex.

Filed Oct. 5, 1983, Ser. No. 539,168
Int. Cl.[3] G01B *5/08, 5/12*
U.S. Cl. 33—147 M **21 Claims**



19. A gage for measuring the inside or outside pitch diameter of a straight or tapered threaded product at a selected distance from the end of the product comprising:

a. a vertical bearing surface contactable with the end of the product;

b. upper and lower pivotable flat thread contact surfaces lying in a vertical plane, the vertical plane being perpendicular to the vertical bearing surface, the thread contact surfaces both being spaced from the vertical bearing surface at a horizontal distance based on the selected distance from the end of the product, the vertical distance between the upper thread contact surface and the lower thread contact surface being variable from an initial vertical distance based on the specified diameter at the selected distance to a vertical distance in which the upper and lower thread contact surfaces are in contact with the thread crests of the product at diametrically opposed points thereon; and

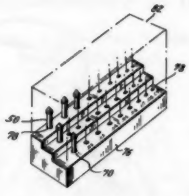
c. means for registering the difference between the initial vertical distance and the vertical distance between the upper and lower thread contact surfaces when in contact with the thread crests of the product at diametrically opposed points thereon.

4,524,525

DIAMOND GAUGE WITH THREE-DIMENSIONAL STONE SIMULANT

Saul M. Finkler, East Meadow, N.Y., assignor to Centennial Jewelers, Inc., New York, N.Y.

Filed Feb. 14, 1984, Ser. No. 580,080
Int. Cl.³ G01B *3/46, 5/12*
U.S. Cl. 33—178 B **20 Claims**



1. A diamond gauge, comprising:

a three-dimensional stone simulant having a central axis and having sections corresponding generally to the culet, the girdle and the table of a cut diamond; and

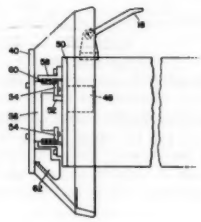
a handle connected to said section corresponding to the table of a cut diamond and extending in a direction generally parallel to said central axis.

4,524,526

APPARATUS AND METHOD FOR INERTIAL MEASUREMENT OF PIPELINE DEFLECTION

Seymour Levine, Topanga, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Nov. 22, 1982, Ser. No. 443,481
Int. Cl.³ E21B *7/00*
U.S. Cl. 33—312 **13 Claims**



5. Apparatus for monitoring curvature along a pipeline comprising, in combination:

(a) means for taking a plurality of measurements of the inertial attitude of said pipeline said means including (i) a pig, (ii) means for measuring the attitude of said pig with respect to inertial space, (iii) means for measuring the attitude of said pig with respect to said pipeline and (iv) means for transporting said pig through said pipeline; and

(b) means for comparing said measurements to locate changes in attitude along said pipeline.

4,524,527

COMBINATION LEVEL SYSTEM FOR A THIN RULE

Jewell W. Jeffrey, Florence, Ala., assignor to Lloyd James Lewis, Florence, Ala., a part interest

Filed Sep. 17, 1982, Ser. No. 419,236
Int. Cl.³ G01B *3/06*
U.S. Cl. 33—451 **10 Claims**

1. A level system for a thin rule comprising, in combination:

a measured section of said rule, including manipulative front and back sides, having

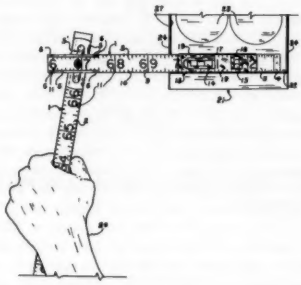
a lengthwise axially disposed aperture for a level extending through said section;

a transversely disposed aperture for a level extending through said section in juxtaposition to said lengthwise aperture;

a lengthwise level cylinder and a transverse level cylinder located respectively in said apertures, each said cylinder being so sized as to centrally dispose the same in its aperture in spaced relation to the sides of its opening;

an encapsulating casting of molded transparent material encompassing said rule section and apertures, enveloping said respective levels in their relative disposed positions;

said casting having a formed section on the front side of said rule section of thickness sufficient to cover said levels and



of length sufficient to extensively cover said apertures and measured section of said rule;

said casting having a formed section on the back side of said rule coextensive with the front side thereof covering said apertures and levels with material of a less thickness than the front side configurated to lie in flat occlusive contact with an adjacent surface; and

said cast further having for its extended length a formed section of rigid material along at least one edge of said rule adjacent to said apertures, said material of relatively small thickness sufficient to provide a structural reinforcement, independent and proportional relationship to the excised aperture rule material, at the linear surface of said edge coextendive and adjacent to each said aperture.

4,524,528

WIND POWERED GRAIN DRYING APPARATUS

Thomas G. Ehlers, 1875 Adair, Dubuque, Iowa 52001

Filed Feb. 8, 1983, Ser. No. 464,816
Int. Cl.³ F26B *13/22*
U.S. Cl. 34—102 **10 Claims**

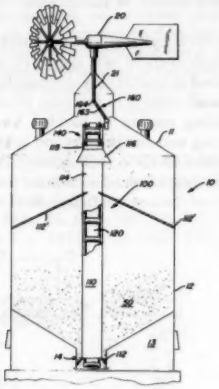
1. In a grain bin having a roof portion, a walled portion, and a sloping floor forming a grain sump, an improved wind powered grain drying apparatus comprising:

a windmill mounted on said roof portion, and having an output shaft extending into the interior of said grain bin,

an elongated conduit disposed in said grain bin, having one end disposed in, but spaced from the grain sump floor, and the other end disposed in the general vicinity of said output shaft, wherein the said other end of said elongated conduit is provided with a cap member and a downwardly depending conical skirt, and

a conveyor system operatively connected to said output shaft, and comprising a conveyor member mounted in said

elongated conduit for raising grain through said elongated conduit and means for rotating said conveyor as a whole

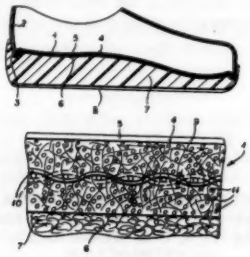


about a vertical axis extending along the axis of said elongated conduit.

4,524,529
INSOLE FOR SHOES

Helmut Schaefer, Winzlerstrasse 114, D-6780 Pirmasens, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,112
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231971
Int. Cl.³ A43B *23/16*
U.S. Cl. 36—98 **33 Claims**



1. A shoe insole assembly comprising:

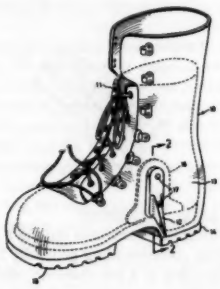
an insole consisting of a fleece substantially formed of synthetic fibers and having arranged therein a reinforcing insert extending in approximately parallel relation to an upper side of the insole supporting the foot, and at least at an upper portion of the fleece which adjacent to the upper side of the insole supporting the foot is a dispersion or emulsion containing at least one percent by weight of hollow microspheres impregnating said fleece, said microspheres having thin shells of a vinylidene chloride copolymer and a hollow core of which contains a gas; and

a body of foam polyurethane bonded to a bottom side of said insole.

4,524,530
SPUR EQUIPPED BOOT

Peter R. Greenway, 5105 Mount Nemo Rd., R.R. #2, Milton, Ontario, Canada (L9T 2X6)

Filed Apr. 13, 1983, Ser. No. 485,387
Claims priority, application Canada, Jan. 6, 1983, 418964
Int. Cl.³ A43B *3/00*
U.S. Cl. 36—113 **5 Claims**



1. A lineman's climbing aid comprising an outer boot adapted to be worn over a standard workboot and a replaceable steel gaff rigidly fastened exteriorly against an inside wall portion of the outer boot, wherein the outer boot comprises a one-piece molding of electrically insulating, water-impermeable, plastics material defining a rigid shell and a steel reinforcing plate embedded within said inside wall portion of the shell, the gaff being fastened to the reinforcing plate by fastening means extending through said inside wall portion whereby said inside wall portion is rigidly clamped between the reinforcing plate and the gaff.

4,524,531
GOLF SHOES

Donald R. VanDeripe, 8 Auvergne Dr., Lake Saint Louis, Mo. 63367

Filed Dec. 2, 1982, Ser. No. 446,424
Int. Cl.³ A43C *15/00*
U.S. Cl. 36—127 **9 Claims**

1. A pair of golf shoes, each shoe comprising a sole and an upper, the sole having a heel section for the bottom of the heel of the foot, an arch section forward of the heel section for the bottom of the arch of the foot, and a front section forward of the arch section for the portion of the foot forward of the arch and for the toes, spikes in the bottom of the heel and front sections, the bottom of the heel and front sections having relatively wide flat beveled surfaces along their inner sides inclined inwardly and downwardly from the inner edge of the sole whereby when the weight of a person wearing the shoe shifts to the inner side of the foot, as during the address and backstroke stages of the golf swing, the shoe is adapted to roll inwardly about the central longitudinal axis of the shoe to a position in which said beveled surfaces are in engagement with

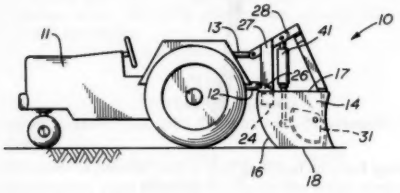
the ground for stably supporting the golfer during said swing, the sole, as viewed from the bottom of the shoe, being beveled along a line extending generally longitudinally of the sole, said line being generally tangent to the inner edge of the arch section at about its narrowest point.

4,524,532

BOX BLADE WITH MOVABLE CLOSURE BLADE

James E. Browning, 10149 Hammerly, Ste. 167, Houston, Tex. 77080

Filed Aug. 24, 1984, Ser. No. 644,196
Int. Cl.³ E02F *3/76*
U.S. Cl. 37—117.5 **15 Claims**



1. A box blade assembly for attachment to earth-moving vehicles comprising:

a box blade frame having two spaced parallel side walls, an open top and bottom, an open front end, a horizontal crossbeam extending transversely between said side walls near said open top and front ends, and a rear wall extending transversely between said side walls, the bottom edge of said rear wall terminating above the bottom edge of said side walls,

an inwardly facing scraper member secured on said box blade rear wall and extending below the bottom edge of said side walls, and

a trailing back fill member pivotally mounted on and carried by said rear wall,

a closure member extending transversely between said side walls and movably supported thereon and movable between an open position substantially exposing said open bottom and a closed position substantially enclosing said open bottom, and

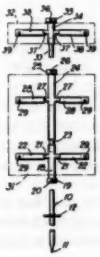
means supported on said box blade frame and operatively connected to said closure member to move the same between said open and said closed positions.

4,524,533

REALTOR SIGN SYSTEM

Samuel A. Still, Jr., P.O. Box 8, Still Rd., Ft. Motte, S.C. 29050

Filed Dec. 12, 1983, Ser. No. 560,246
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—607 **3 Claims**



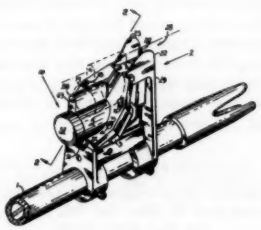
1. A sign system for realtors and like comprising an elongated sign support standard adapted to be driven in the soil for anchorage therein and having a driving element between its ends adapted to contact the surface of soil into which the standard is driven, a first sleeve engageable telescopically and adjustably over the top of the standard and having a lower end locking set screw adapted to engage the standard for locking the first sleeve thereon at a prescribed height, a cross bar on the first sleeve between its ends substantially at right angles thereto and projecting equidistantly on opposite sides thereof, a pair of sign panel support sleeves telescopically and adjustably mounted on said cross bar on opposite sides of the first sleeve and having transverse apertures formed therethrough near their outer ends, a bar fixed coaxially within the first sleeve and extending beyond one end of the first sleeve, a second sleeve engaged telescopically and adjustably with the last-named bar and being coaxial therewith and being extendable and retractable on the last-named bar away from and toward the cross bar, a second cross bar on the second sleeve between its ends substantially at right angles thereto and parallel to the first-named cross bar and projecting equidistantly on opposite sides of the second sleeve, another pair of sign panel support sleeves telescopically and adjustably mounted on the last-named cross bar on opposite sides of the second sleeve and having transverse apertures formed therethrough near their outer ends, the second sleeve having an upper end locking set screw, a comparatively short bar coaxially telescopically engageable within the second sleeve and adapted to be locked therein by the last-named set screw, a comparatively short sleeve coaxially receiving one end of the comparatively short bar and fixed thereto and having a set screw near one end thereof away from the comparatively short bar, whereby the comparatively short sleeve can receive telescopically and be locked to another coaxial bar of an auxiliary sign support structure, a third cross bar on the comparatively short sleeve between its ends substantially at right angles thereto and projecting equidistantly on opposite sides thereof, and a pair of auxiliary sign panel support sleeves telescopically and adjustably mounted on the third cross bar on opposite sides of the comparatively short sleeve and having transverse apertures formed therethrough near their outer ends.

4,524,534

POSITION ACTUATED ILLUMINATED GUNSIGHT

Gordon E. Kaye, Garrison, and Joseph A. Agnello, Jr., Peekskill, both of N.Y., assignors to Univention Incorporated, Garrison, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,476
Int. Cl.³ F41G *1/34*
U.S. Cl. 42—1 S **1 Claim**



1. An illuminated gunsight for an M-16 rifle having an elevated ramp sight terminating at its upper end in a platform with wing sections extending upwardly from said platform which platform and wing sections form a target framing area, said sight further comprising a ramp section, said gunsight comprising a peripheral skirt adapted for seating engagement with the ramp section of said sight, and extension elements for engagement with said wing sections, said gunsight further comprising anchoring means for fixed engagement of said gunsight with

said ramp section, said gunsight further comprising a moveable illumination member having a light emitting diode and an electric battery, having positive and negative terminals, contained therein, with electrical connections between said light emitting diode and the terminals of said battery, said light emitting diode being visible to the rear of said firearm, said illumination member including said light emitting diode being moveable in a direction up and down said ramp into and out of aligment with said target framing area, means electrically disconnecting one of said electrical connections from said battery when said illumination member with light emitting diode is moved down said ramp and out of alignment with said target framing area without removal of said gunsight from the rifle, and wherein said gunsight further comprises a moveable activation member which forces said disconnected electrical contact into electrical contact with said battery when said illumination member is moved up said ramp and into alignment with said target framing area, whereby said contained light emitting diode is electrically activated for sighting.

4,524,535

TROLLING METHOD AND APPARATUS

Robert L. Bates, Tucson, Ariz., assignor to Agro Land & Cattle Company, Inc., Tucson, Ariz.

Filed Jan. 31, 1983, Ser. No. 462,567
Int. Cl.³ A01K *79/00*
U.S. Cl. 43—4.5 **22 Claims**

1. A trolling array comprising a pair of running lines adapted to be towed astern of a moving fishing vessel, spacing bars connecting said running lines at spaced intervals for maintaining separation between said running lines, means detachably connecting said bars to said running lines to permit the bars to be separated from the running lines when the latter are hauled aboard the vessel, and shearing means for controlling the position of the array in the water as the array is towed through the water.

13. A method of trolling comprising setting a first pair of running lines to one side and astern of a vessel, detachably securing a plurality of spacing bars at spaced intervals along said running lines to maintain separation between the lines of the first pair, detachably securing a plurality of branch lines to the running lines of said first pair, said branch lines having jigs attached thereto, hauling in said first pair of running lines while setting a second pair of running lines from the other side of the vessel, removing fish from the jigs as they approach the vessel and transferring branch lines and spacing bars from said first pair of running lines to said second pair of running lines.

4,524,536

FISHING LURE RETRIEVER

Richard L. Eckerson, 415 Corunna Ave., Owosso, Mich. 48867

Filed Oct. 17, 1983, Ser. No. 542,753
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—17.2 **16 Claims**

1. A fishing lure retriever for disengaging a lure with fish hooks from an obstacle comprising

a heavy main body,

a fishing line guide extending from same main body and engageable by the fishing line for guiding the main body along the fishing line,

means for attaching a handling line to the body at a point spaced from the guide,

a post extending outwardly from said main body at a point spaced from said guide and said means for attachment of the handling line,

a hook engaging body being telescoped over said post,

said hook engaging body defining a surface extending radially outwardly from the main body such that when the fish lure is lodged in an obstruction, the retriever is first engaged with a fishing line by engaging the guide with the

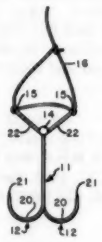
fishing line, the handling line is then utilized to lower the retriever under the weight of the main body downwardly along the fishing line and when the main body approaches the fishing lure is applies a force tending to dislodge the fishing lure from the obstruction and to move the hook engaging body into engagement with the hooks of the fish lure so that the fish lure can be retrieved by lifting the handling line.

4,524,537

BARBLESS FISHHOOK

Arthur F. Malchert, Sr., 2030 S. 1st Ave., Maywood, Ill. 60153

Continuation-in-part of Ser. No. 495,919, May 23, 1983, abandoned, which is a continuation of Ser. No. 267,351, May 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 178,838, Aug. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 92,211, Nov. 7, 1979, abandoned. This application Aug. 16, 1983, Ser. No. 523,603
Int. Cl.³ A01K *83/02*
U.S. Cl. 43—36 **2 Claims**



1. A reversible, springless, barbless fishhook comprising:

(A.) a pair of generally similar wire hook halves, each half being formed of a single length of wire bent into:

(i) a generally straight center shank portion;

(ii) a barbless hook portion at one end of said generally straight center shank portion;

(iii) a first loop at the opposite end of said straight portion; and

(iv) an offset upper portion, offset at an angle between about 30 degrees and 50 degrees toward and generally in the plane of said hook portion and said center shank portion, extending from said loop and terminating in a leader-receiving eye portion,

(B.) means for allowing center shank portions of said hook halves to pass each other upon tong-like movement of said

hook halves comprising: a pivot pin including means for adjusting tension joining said hook halves at the loops and said hook halves being in parallel planes, said pivot pin providing a sole means for holding said hook halves with controlled tension while permitting tong-like movement of both said hook halves toward each other from an initial position with the hook portions splayed inwardly or away from each other from an initial position with the hook portions splayed outwardly, and

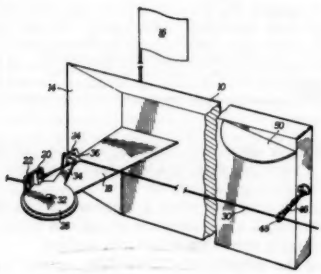
(C.) a leader extending movably through both said leader-receiving eyes, said leader forming a fixed bight, so that tension applied to a hook by a fish urges said offset upper portions together, and either moves said barbless fishhook portions apart when the hook portions are initially splayed outwardly and baited or moves said barbless hook portions together when the hook portions are initially splayed inwardly and baited.

4,524,538

TROLLING BOARD

Stephen H. Halvorsen, 2935 Alabama Ave., Minneapolis, Minn. 55416

Filed Apr. 5, 1983, Ser. No. 482,070
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—43.13 **4 Claims**



1. A trolling board adapted to be towed on a fishing line behind a boat comprising a flat elongated buoyant body member, weighted and therefore heavier on one side and having an oblique surface adapted to cause said device to move toward one side when towed in water, said trolling board being provided means adapted to engage a fishing line towed behind a boat, said engaging means being provided with a trip mechanism which releases said line when a fish strikes the baited end thereof, said mechanism including a stationary surface and a rotatable member having an eccentric surface which upon rotation will engage said stationary surface so that a line placed between the stationary surface and rotatable member will be squeezed therebetween in a direction such that pulling on the line from the reel urges the same to engage the line more tightly, said rotatable member having a trip lever attached integrally thereto adapted to engage the line at a point nearer the baited end of said line so that a strike on said bait will rotate the locking mechanism in a direction to disengage the line therefrom.

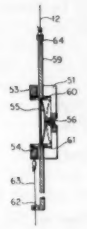
4,524,539

THERMOSTATIC FISHING DEVICE

Robert C. Morris, 98 Emmans Rd., Ledgewood, N.J. 07852, and Russell S. Shelton, 9 Park Ave., Flanders, N.J. 07836

Continuation-in-part of Ser. No. 229,134, Sep. 3, 1981, abandoned. This application Dec. 13, 1983, Ser. No. 560,879
Int. Cl.³ A01K *91/06, 97/00*
U.S. Cl. 43—44.87 **9 Claims**

1. In a fishing assembly to be located in a water environment including a sinker in said water and connecting means extending from the surface of said water to said sinker, a frame which encloses a portion of said connecting means to loosely engage said portion, a bimetallic member supported by said frame, said bimetallic member adapted for changing state between two states in response to the temperature of said water environment



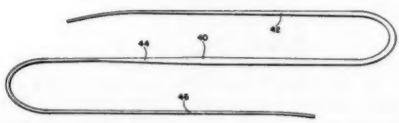
in which said assembly is located, and means responsive to said change of state of said bimetallic member for engaging said connecting means between said member and said frame in one of said states and for disengaging from said connecting member in the other of said states.

4,524,540

FLY LINE

Lee Wulff, Beaverkill Rd., Lew Beach, N.Y. 12753

Filed Jul. 26, 1982, Ser. No. 402,151
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—44.98 **7 Claims**



1. A fly line for fly casting comprising a certain length of line having a forward portion for attachment of a leader and a rear portion for attachment to a spool of a reel, less than one-half of the line at the forward end thereof tapering from a thickest portion adjacent the center of the line to a narrowest portion adjacent to the forward terminal end of the line to which the leader is to be applied, a short reverse taper beginning at the thickest portion of the tapering forward end of the line, and the remainder of the line following said reverse taper being generally of constant diameter less than the tapered forward portion of the fly line.

4,524,541

BLOOMING PLANT IMPLANT WITH MESSAGE HOLDER

Albert F. Geiges, Jr., 3157 Mechanicsville Rd., Bensalem, Pa. 19020

Continuation-in-part of Ser. No. 502,291, Jun. 8, 1983,. This application Mar. 8, 1984, Ser. No. 587,448
Int. Cl.³ A01B *79/00*
U.S. Cl. 47—58 **6 Claims**

1. A method for implanting an object within a blossom capable of blooming, said blossom having a receptacle and a plurality of petals and said object provided with a signal device adapted to provide a signal for indicating the presence of said object, and wherein said method comprises:

removing a plug member from said plant so as to form a channel leading into an interior portion of said blossom;

placing said object within said signal device so as to retain said object therein;

inserting said signal device and said object retained therein

through said channel into said interior portion of said blossom such that said object is removed from open sight; and

replacing said plug member within said channel whereby upon opening of the blossom the signaling device signals the presence of the object.

4,524,542

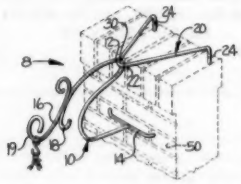
ORNAMENTAL FIXTURE FOR SUSPENDING POTTED PLANTS

James J. Elliott, 700 Museum Dr., Charlotte, N.C. 28207

Filed Nov. 28, 1983, Ser. No. 555,665

Int. Cl.³ A01G *9/02*

U.S. Cl. 47—67 **1 Claim**



1. An ornamental fixture for suspendingly supporting potted plants or the like alongside a vertical surface such as the vertical surface of a supporting wall, fence or the like, and comprising:

an elongate skeletal bracket formed of rod-like material having a sinuous configuration including first and second end portions and a loop portion formed therein between said end portions,

mounting means formed of rod-like material and adapted to be carried by said vertical surface and having a generally V-shaped configuration with the apex of the V forming a loop portion extending through said loop portion of the sinuous elongate skeletal bracket with the respective loop portions of said bracket and mounting means being at substantially right angles to each other and with the bights of the loops in detachable interengagement for mounting the bracket alongside the vertical surface,

said mounting means also having a pair of wall engaging feet remote from said loop portion of the mounting means and adapted to engage the opposite vertical surface of the wall, fence or the like from the vertical surface alongside of which the bracket is supported,

said elongate skeletal bracket including abutting means carried by said first end portion and being positioned below the point of detachable engagement of said loop portion of said bracket with said mounting means and extending laterally on remote opposite sides of the point of detachable engagement of said bracket to said mounting means for abuttingly engaging said vertical surface and stabilizing and positioning said bracket to extend in an outwardly projecting manner from said vertical surface, and

said bracket including hook means carried by said second end portion and being positioned beneath and outwardly of and remote from said point of engagement of the bracket with the mounting means for suspendingly receiving thereon a potted plant or the like so that the potted plant will be suspendingly supported alongside the vertical surface.

4,524,543

VIBRATORY ABRASIVE CONTOUR-FINISHING METHOD AND APPARATUS

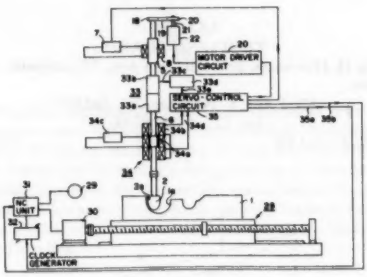
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Oct. 13, 1983, Ser. No. 541,667

Claims priority, application Japan, Oct. 18, 1982, 57-181258

Int. Cl.³ B24B *7/00*

U.S. Cl. 51—34 R **4 Claims**



1. A method of abrasively finishing a shaped workpiece surface with a vibratory axial tool by means of abrasive grits, the method comprising the steps of:

(a) rotating the axial tool about a longitudinal axis thereof while vibrating it in the direction of said axis to provide a reciprocatingly revolving active tool surface;

(b) bringing the reciprocatingly revolving active tool surface into pressure engagement with a portion of said shaped surface of the workpiece in the presence of the abrasive grits therebetween;

(c) relatively displacing said axial tool and said workpiece generally translationally and transverse to said longitudinal axis so that the reciprocatingly revolving active tool surface sweeps starting with said portion and successively over an entire area of said shaped surface while maintaining the abrasive pressure engagement therewith;

(d) instantaneously sensing a load encountered by said reciprocatingly revolving active tool surface in the abrasive pressure engagement with said shaped surface to produce an output signal representing an instantaneous change in said load; and

(e) in response to said output signal, controlling said relative translational displacement between the tool and the workpiece so as to maintain the load exerted on said reciprocatingly revolving active tool surface substantially constant.

4,524,544

MACHINE FOR BACKING-OFF AND/OR GRINDING DRIFTING SPINDLES PROVIDED WITH TEETH

Robert Habib, 36, Quai Gustave Adord, 1207 Geneva, Switzerland

Filed Feb. 9, 1983, Ser. No. 465,256

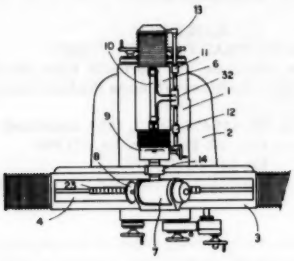
Claims priority, application Switzerland, Mar. 5, 1982, 1351/82

Int. Cl.³ B24B *3/22*

U.S. Cl. 51—92 R **1 Claim**

1. A machine for backing-off and grinding drifting spindles provided with teeth comprising a sliding table and a grinding spindle and associated conical grinding wheel mounted on a support on said table, with said support being oriented and

movable transversely with respect to said table, mounting of said grinding spindle to said support including a pivotable slide having a sliding plane vertical and parallel to said grinding spindle's axis with a sliding direction being oriented in said plane, said slide having a fixed part and a movable part, said fixed part comprising a cylindrical bore perpendicular to said sliding plane and cooperating with a first journal of a first drum integral with said support of said grinding spindle which allows positioning of said slide in a desired sliding direction by rotation about said journal and further providing a locking



means for locking said slide in a desired angular position, said grinding spindle being further supported by a second drum fixed to said movable part of said slide, said second drum having an axis perpendicular to said spindle and comprising a second journal cooperating with a bore in said movable part of said slide in order to allow angular positioning of said grinding spindle with respect to said sliding table in a plane parallel to the sliding plane of said slide, by rotation of said second journal in said bore of said movable part of the slide, said locking means also provided for locking said second drum in a desired angular position.

4,524,545

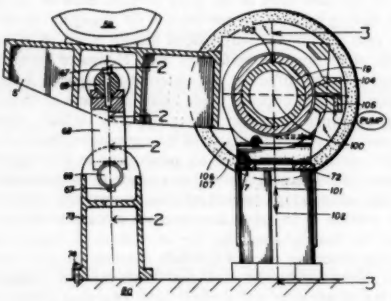
GRINDING MACHINE

Karl-Heinz Giebmanns, Westport, Conn., assignor to ITM International Tool Machines Inc., Westport, Conn.

Continuation-in-part of Ser. No. 284,410, Jul. 17, 1981, Pat. No. 4,468,892. This application Nov. 15, 1983, Ser. No. 551,715

Int. Cl.³ B24B *7/00*

U.S. Cl. 51—99 **10 Claims**



1. In a grinding machine, an improved grinding wheel support arrangement, comprising in combination,

a support table;

a first post threadably adjustably mounted in a direction normal to said support table;

a pair of second posts fixedly mounted on said support table;

a first support shaft rotatably supported in said pair of second posts;

an intermediate member secured to said first support shaft at one of its two ends and having a second support shaft secured to its other end;

a housing for supporting a drive motor;

a grinding wheel shaft rotatable in said housing;

a grinding wheel coaxially mounted on said grinding wheel shaft;

said first post being connected to said grinding wheel shaft so that their respective axes intersect each other;

a second support shaft being rotatably mounted in said housing and being parallel to said grinding wheel shaft; and

said housing being pivotally connected to said intermediate member via said second support shaft.

4,524,546

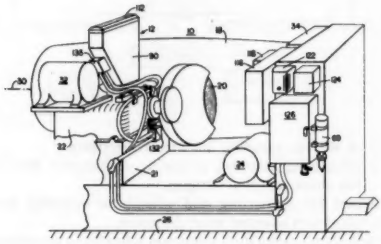
ROLL PROFILE GAUGE

Bradley R. Hoover, 661 Schultz, Hamilton, Ohio 45013, and Karl T. Bagdal, 2014 Erie Ave., Middletown, Ohio 45042

Filed Jun. 6, 1983, Ser. No. 501,644

Int. Cl.³ B24B *49/04*

U.S. Cl. 51—165 R **25 Claims**



1. In a conventional roll grinding apparatus of the type having a head stock and a tail stock mounting a roll to be ground, a grinding wheel mounted on a housing, means to traverse the housing longitudinally of said roll, means to shift the housing toward and away from said roll in a direction substantially perpendicular to the roll axis, and means for rotating said roll, a gauge mounted on said housing, said gauge having a sensor for continuously sensing the distance between said sensor and the roll surface as said housing traverses said roll, means to move said sensor toward and away from said roll relative to said housing, transducer means for converting said sensor output into an electric output, a chart recorder having circuitry driving a pen and an input and output, the output of said chart recorder producing a chart recording, the improvement in combination therewith comprising:

an electronic processor having inputs and outputs, an output of said transducer being connected to an input of said processor;

means within said processor that determines the diameter of roll being measured and adjusts the gain of said circuitry driving said pen of said chart recorder;

input means within said processor to read the output signal from said transducer and measure the distance between the transducer signal and an established reference voltage;

means within said processor whereupon to multiply the signal from said transducer by the magnification factor derived from the number of sensor positioning steps to move said sensor from its home position to its reference location near the surface of the roll;

means within the processor to thereupon generate an output signal to said chart recorder comprising the average of a plurality of individual signal readings to provide a smooth chart recording which ignores minor variations in roll diameters; and

the output of said chart recorder producing a chart recording which has a linear scale to profile the surface of the roll traversed by said sensor;

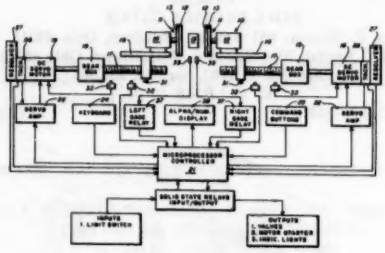
whereby to improve the resolution, accuracy and ease of profile gauging worn and ground rolls of various diameters.

4,524,547

AUTOMATIC DOUBLE DISC GRINDER CONTROL CYCLE

Gaylord E. Heaston, Beloit, Wis., and Edward A. Farazandeh, Aurora, Ill., assignors to Litton Industrial Products, Inc., South Beloit, Ill.

Filed Sep. 6, 1983, Ser. No. 529,625
Int. Cl.³ B24B *49/18*
U.S. Cl. 51—165.77 **2 Claims**



1. A surface grinding machine comprising

a wheelhead assembly including an abrasive disc having a flat stock removal surface,

means for supporting said wheelhead assembly for movement in a selected axial direction,

means for axially displacing said wheelhead assembly including

means for defining a selected infeed program for said wheelhead assembly having at least an initial infeed distance, at an initial feed rate, and a finish infeed distance at a finish feed rate wherein the total infeed distance extends from a retracted position to the finish size position whereat a workpiece has been ground to size, and

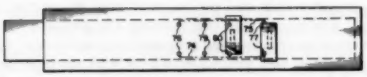
means for disabling said axially displacing means in the event said wheelhead assembly is axially advanced to a predetermined location a selected distance beyond said finish size position.

4,524,548

CONTINUOUS DEFLASHING SYSTEM

David J. Klee, Emmanus, and Donald J. Ehnot, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 22, 1983, Ser. No. 487,679
Int. Cl.³ B24C *1/00*
U.S. Cl. 51—322 **5 Claims**



1. In the pellet blasting of molded articles for removal of embrittled flash therefrom, wherein said articles are contacted with a high velocity stream of blasting media while said articles are being continuously conveyed on the upper surface of an endless belt in a longitudinal travel path through a chilling tunnel from an article entrance end to an article discharge end of said tunnel, the improved operating method which comprises:

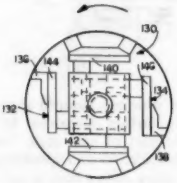
spraying liquefied gas coolant into said tunnel at a plurality of locations along the travel path of said articles within the tunnel, directing the liquefied gas spray from opposed directions tranversely of the travel path from an elevated position sufficiently above the conveyed articles such that the sprayed liquefied gas is evaporated before any of the liquefied gas spray contacts the articles in liquid form, and setting the relative quantity of liquefied gas spray at each of said plurality of locations selectively to provide a biased positive flow of most of the evaporated coolant towards the article entrance end of the tunnel to effect gradual cooling of articles introduced at said entrance end.

4,524,549

HONING HEAD CONSTRUCTION

Robert M. Sunnen, Frontenac, and Morton B. Estes, St. Louis County, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Continuation of Ser. No. 414,472, Sep. 2, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,040
Int. Cl.³ B24B *33/02*
U.S. Cl. 51—347 **15 Claims**



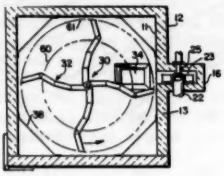
1. A honing mandrel having six circumferentially spaced work engaging members thereon comprising a body portion having a bore extending therethrough, a pinion gear mounted for rotational movement in the bore, at least four sets of spaced transverse body bores, the bores in each set extending through the body in positions to intersect the bore in which the pinion gear is located at spaced locations therealong, said four sets of transverse bores being arranged in first and second angularly related opposed sets on the body portion, a pair of opposed honing assemblies each including an elongated member having opposite surfaces, a set of rack gears extending from one of the opposite surfaces on each honing assembly at locations for positioning in the respective bore sets of the first opposed sets whereby the honing assemblies are arranged in opposed relation on opposite sides of the body portion, each of said rack gears having rack gear teeth thereon for engaging the pinion gear, two circumferentially spaced honing members mounted on the other opposite surface of each elongated member to engage a work surface at circumferentially spaced locations thereon, a pair of opposed guide assemblies each including an elongated support member having opposite surfaces, a set of rack gears extending from one of the opposite surfaces of each support member at locations for positioning in the respective bore sets of the second opposed sets whereby the guide assemblies are arranged in opposed relation on opposite sides of the body portion at locations intermediate circumferentially between the honing assemblies for movement in diametrically opposite directions, each of said rack gears on the guide on the guide assemblies having rack gear teeth thereon engageable with the pinion gear, and a single work engaging guide member mounted on the opposite surface of each elongated support member, the rack gears for the respective guide assemblies and the respective work engaging guide member thereon being located on the respective guide assemblies on opposite sides of the diameters along which the respective guide assemblies move when the pinion gear rotates, the two work engaging honing members on each of the honing assemblies and the work engaging guide member on each of the guide assemlies establishing said six circumferentially spaced work engaging members on the honing mandrel.

4,524,550

DISCHARGE OF BLASTING MEDIA FROM A TREATING CHAMBER

Thomas W. Burke, Allentown, and David J. Klee, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 30, 1982, Ser. No. 445,603
Int. Cl.³ B24C 9/00
U.S. Cl. 51—424 4 Claims



1. In apparatus for pellet blasting of articles to remove molding flash or coatings therefrom by projecting a high velocity stream of such pellets against the articles within a thermally insulated enclosure containing gaseous coolant; wherein the resulting mixture of pellets and refuse comprising fragments of removal flash or coating material is collected at the bottom of said enclosure and is screened to recover separated reusable pellets for recycling to the blasting apparatus, the improvement which comprises:

a rotating sweep device within said enclosure above the bottom thereof, said sweep device having a plurality of outwardly extending sweep arms traversing the bottom of said enclosure;

each of said sweep arms being attached to a central hub and shaped to approximate an ogee curve, with the innermost portion of each arm being displaced rearwardly away from the direction of rotation and the outermost portion being displaced forwardly in the direction of rotation, whereby respective portions of the mixture at the bottom of said enclosure are caused to move through adjoining paths, the innermost path being defined by a central circular area and the outermost path being defined by an annulus surrounding said circular area, such that the mixture within said circular area during rotation of said sweep device is caused to move radially outward and the mixture within said annulus is caused to move radially inward; and

an opening in the bottom of said enclosure into which the mixture of pellets and refuse swept by said sweep device is discharged for transport to separation means for said mixture;

wherein said sweep device is driven by a shaft attached to said central hub, which shaft extends through said bottom of said enclosure and is surrounded by a tubular sleeve extending through said bottom to a level within said enclosure above said bottom and forming an annular space, and means for introducing a purge gas to expel solids, liquids and condensable gases from said annular space.

4,524,551

CONSTRUCTION UNITS FOR THE ERECTION OF WALLS AND METHOD OF UTILIZATION

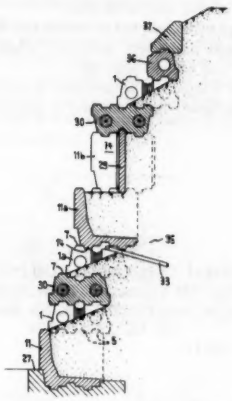
Rolf Scheiwiller, Beichelacker, 3115 Gerzensee, Switzerland

Filed Mar. 8, 1982, Ser. No. 356,909
Claims priority, application European Pat. Off., Mar. 10, 1981, 81810089.3
Int. Cl.³ E04C 1/10
U.S. Cl. 52—98 36 Claims

1. A kit comprising a plurality of construction units capable of being assembled for the construction of walls, at least some of said units having structural features including:

a rectangular base face having a longitudinal axis parallel to a first rectangular dimension, a lateral axis parallel to a second rectangular dimension, and at least one longitudinal rib oriented parallel to said longitudinal axis and projecting outwardly from said base face, said rib being adapted for engagement with other units;

lateral faces adjoining the full length of one of each of the opposite ends of said base face that are parallel to the lateral axis, each lateral face having a corresponding trapezoidal profile with two parallel unequal-length base lines, a longer base line and a shorter base line, each of said shorter base lines adjoining said ends of said base face,



each of said longer base lines defining at least one longitudinal slot oriented parallel to said longitudinal axis, said slot being adapted for engagement with the ribs of other units for assembly of units into a wall;

a circumscribing surrounding trapezoidal central groove defined by said unit and positioned symmetrically with the longitudinal centerline of said base face and perpendicular to said base lines of said lateral faces; and

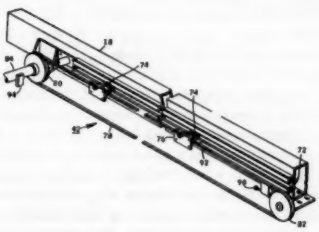
said kit further including a plurality of generally planar panels adapted to be retained in said trapezoidal groove.

4,524,552

MECHANISM FOR DEPLOYING A DEPLOYABLE TRUSS BEAM

Edward J. Hujsak, La Jolla, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Oct. 9, 1981, Ser. No. 310,195
Int. Cl.³ E04H 12/18
U.S. Cl. 52—108 7 Claims



1. Means for moving tube node fittings along a rail from first closely spaced positions to second widely spaced positions which comprises:

at least one guide rail including means for guiding tube

fittings for movement therealong from a first locked position to a second position;

an endless tape threaded around a drive sprocket and an idler sprocket, said tape between said sprockets being substantially parallel to said guide rail;

drive means to selectively move said tape in either direction;

unlocking means on said tape for unlocking means locking said fittings in said first position as said unlocking mean is moved with said tape past said fitting;

latch means on said tape for engaging said fitting so that said fitting is moved from said first position to said second position as said tape is moved;

said latching mean adapted to release said fitting upon reversal of tape movement direction when said fitting has reached said second position;

wherein all fittings may sequentially be unlocked and moved along said guide rail from first to second positions.

4,524,553

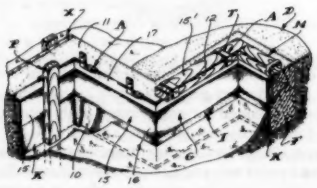
THERMAL INSULATED BUILDING SLAB

John H. Hacker, 714 Eugene Rd., Palm Springs, Calif. 92264

Filed May 19, 1983, Ser. No. 496,197

Int. Cl.³ E02D *27/00*

U.S. Cl. 52—169.11 **12 Claims**



1. A thermally insulated foundation structure comprising a monolithic concrete foundation with a lower portion set in the ground, an upper portion projecting up from the surface of the ground and having a multiplicity of straight sides about its perimeter with horizontal top and vertical outside surfaces; a thermal insulating girdle comprising a plurality of elongate horizontal, U-shaped channel sections in end to end relationship about the perimeter of the upper portion of the foundation at the outside surfaces thereof, said channel sections have vertical, outside walls, vertically spaced horizontal top and bottom walls projecting inward from the outside walls and vertically spaced upper and lower flanges projecting up and projecting down from rear edges of the top and bottom walls; and cores of thermal insulating material within and carried by the channel sections; and a plurality of anchoring units in spaced relationship about the foundation securing the channel sections to the foundation, said anchor units include deadman portions set in the foundation inward of the channel sections and including elongate upper and lower legs extending inward from the channel sections and having formed outside ends engaged with related upper and lower flanges of said channel sections, an elongate wood mud sill on and projecting up from the top surfaces of the foundation adjacent the sides thereof, said mud sill has vertical outside surfaces and horizontal top surfaces, said anchoring units include tie means to orient and secure the mud sill on and to the foundation, said tie means includes elongate extensions on the outer ends of the upper legs, said extensions have vertical lower portions engaging the outside surfaces of the mud sill and horizontal upper portions engaging and fastened to the top surfaces of said mud sill.

4,524,554

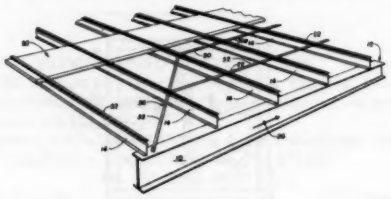
STRUCTURAL BRACING SYSTEM

Harold G. Simpson, Oklahoma City, Okla., assignor to Encon Products, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 93,173, Nov. 3, 1979, Pat. No. 4,329,823. This application Sep. 29, 1981, Ser. No. 306,662

Int. Cl.³ E04C *3/02*

U.S. Cl. 52—693 **17 Claims**



1. A building assembly comprising:

a primary structure;

a first secondary structural member, having a first end and a second end, the first secondary structural member supported at its first and second ends by the primary structure; diagonal bracing means, connected to and extending obliquely from the primary structure and the first secondary structural member, for increasing the load carrying capacity of the first secondary structural member by substantially restricting the horizontal translation and the rotation of the first secondary structural member;

a second secondary structural member having a first end and a second end, the second secondary structural member supported at its first and second ends by the primary structure and extending substantially parallel to the first secondary structural member; and

first parallel bracing means for laterally stablilizing the second secondary structural member, the first parallel bracing means connected to the first secondary structural member and to the second secondary structural member, the first parallel bracing means attached to the first secondary structural member adjacent the point of attachment of the diagonal bracing means thereto.

4,524,555

SECTION-IRON FOR BRACES OR UPRIGHTS FOR LATTICE GIRDERS AND LIKE STRUCTURES

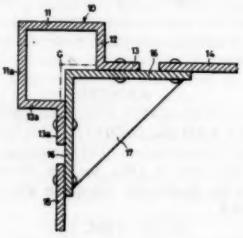
Antonio Pantalone, Via Carpaccio 4, Milan, Italy 20133

Filed Jul. 23, 1980, Ser. No. 171,351

Claims priority, application Italy, Jul. 26, 1979, 24717 A/79

Int. Cl.³ E04C *3/06, 3/32;* **E04H** *12/10*

U.S. Cl. 52—738 **2 Claims**



1. A section-iron for braces or uprights of lattice girders, comprising an equal-sided angle iron, characterized in that each side of the angle iron is equal in length and is extended at its free end by a first extension having a length equal to one half

the length of a side and extending angularly at 90° with respect to the associated side, and in the same direction as the other side of the angle iron, and by a second extension which has also a length equal to one half of the side length of the angle iron and which extends angularly at 90° with respect to the first extension, and in the direction away of said other side of the angle iron.

4,524,556

SURFACE TYPE STRUCTURAL COMPONENT, ESPECIALLY FOR AIRCRAFT

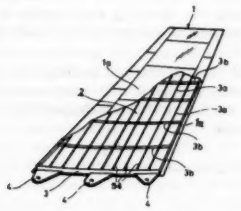
Branko Sarh, Hamburg, and Hartmut Pasenau, Bremen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 228,680, Jan. 26, 1981,. This application Oct. 11, 1983, Ser. No. 540,705

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003552

Int. Cl.[3] **E04C** *2/36;* **B64C** *1/00*

U.S. Cl. 52—807 **5 Claims**



1. A surface type structural shell component, particularly suited for aircraft, comprising a grid structure of longitudinal ribs and curved cross ribs of fiber reinforced compound material, said grid structure defining a main plane, said grid structure comprising a plurality of wound box frames, each box frame including two longitudinal wall members and two cross wall members, said wall members having a width extending substantially perpendicularly to said main plane of the grid structure, said box frames being assembled and bonded together to form the reinforcing grid structure wherein the longitudinal wall members in their end-to-end relationship define said longitudinal ribs, said cross wall members being sufficiently short relative to said longitudinal wall members for forming said curved cross ribs by the end-to-end relationship of said cross wall members of the grid structure for reinforcing the surface type structural shell component, and a laminated planking (**1***a*) bonded to said reinforcing grid structure, each of said wall members of said box frames comprising multiple layers of a tape of fiber reinforced compound material forming each box frame, said layers forming said box frame wall members extending substantially perpendicularly to said main plane, said tape being wider than the width of said longitudinal wall members of the box frame and forming bent over longitudinal flanges (**23** and **24**) extending substantially in parallel to said main plane, said component further comprising tapes (**54**) bonded to said longitudinal flanges (**23, 24**) with the tapes (**54**) extending over two adjacent longitudinal flanges (**23, 24**).

4,524,557

SHEET PROCESSING APPARATUS

Harold Silverman, Wilton; James S. Ramsey, Shelton, and Robert Irvine, Riverside, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 9, 1984, Ser. No. 569,413

Int. Cl.[3] **B65B** *11/48*

U.S. Cl. 53—55 **5 Claims**

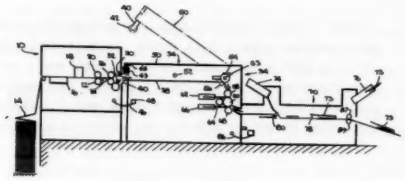
1. Sheet processing apparatus for bursting discreet sheets from a continuous web of paper having equally spaced perforation lines thereacross, folding the discreet sheets and inserting the sheets into envelopes, said apparatus comprising:

A. a bursting machine having means for feeding a continuous web of paper and means for bursting discreet sheets from said continuous web across the perforation lines;

B. a folding machine having means for receiving said discreet sheets from said bursting machine and for folding said sheets;

C. an inserting machine having means for receiving said folded sheets from said folding machine, means for inserting said folded sheets into envelopes at an inserting station, and means for feeding said envelopes to said inserting station;

D. (i) means for removably connecting said bursting machine to said folding machine, (ii) means for removably connecting said folding machine to said inserting machine and (iii) means for removably connecting said bursting machine directly to said inserting machine in the absence of said folding machine;



E. control means operatively interconnected between said inserting machine and said folding machine for controlling the sequential operation of said folding machine with the cyclical operation of said inserting machine so that said folding machine operates on demand from said inserting machine;

F. control means operatively interconnected between said folding machine and said bursting machine for controlling the sequential operation of said bursting machine in timed relationship with the cyclical operation of said folding machine so that said bursting machine operates on demand from said folding machine;

G. control means operatively interconnected between said bursting machine and said inserting machine for controlling the operation of said bursting machine by said inserting machine in the absence of said folding machine; and

H. control means in the bursting machine for controlling the operation of said bursting machine in the absence of both the folding machine and the inserting machine.

4,524,558

SHEET HOLDER FOR FOOD DISPENSER

Bernard Miles, 119 Trenton Ave., Point Pleasant Beach, N.J. 08742

Filed Aug. 5, 1983, Ser. No. 520,575

Int. Cl.[3] **B65B** *25/08, 35/50, 41/02*

U.S. Cl. 53—157 **15 Claims**

1. Apparatus for holding and feeding sheets along a conveying means to be interleaved with a stack of formed food patties and actuated by a vertically oscillating shaft comprising:

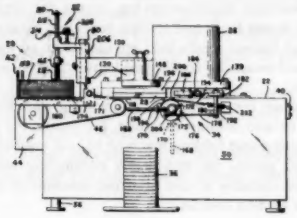
a feed arm having means at one end for connection to the vertically oscillating shaft,

a vertical rod having a pressure foot at the lower end,

a slidable tube enclosing the upper portion of said rod, said tube and rod passing through the other end of said feed arm,

a spring around the lower end of said rod between the bottom of said tube and said pressure foot, said pressure foot being adapted to rest on the top of a stack of sheets supported over the conveying means below said foot, and

pivotable locking means mounted on said feed arm adjacent said slidable tube and having an opening in one end for receiving said tube, said locking means normally resting in a horizontal position and pivoting to an angular position upon downward movement of said vertically oscillating shaft and arm, said locking means and opening in said



angular position gripping said tube and moving said tube downwardly against said spring to urge said rod and pressure foot against said stack of sheets and cause the lowermost sheet to be forced against said conveying means to be pulled from said stack and fed along said conveying means for interleaving with said food patties.

4,524,559

HAND WRAPPING APPARATUS

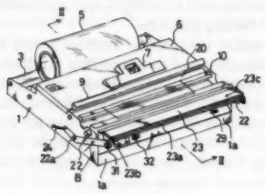
Shigeru Ikemoto, 36-banchi, Honmaeda-cho, Nakagawa-ku, Nagoya, Japan

Filed Aug. 4, 1983, Ser. No. 520,507

Claims priority, application Japan, Aug. 27, 1982, 57-130135[U]

Int. Cl.³ B65B *11/02*

U.S. Cl. 53—219 **5 Claims**



1. A hand wrapping apparatus packages comprising

a frame;

a pair of transverse rollers carried by the frame and rotatively supporting a roll of film thereon,

film from the roll being adapted to be wrapped around the package;

a lid plate supported by the frame forwardly of the rollers, the lid plate having a product rest supported thereon;

a cross extension pivotally mounted on the frame forwardly of the lid plate, a film withdrawal slot being defined between the lid plate and the cross extension to permit film from the roll to be pulled therethrough,

the cross extension comprising foward and rearward film snubbers,

the cross extension being pivotal relative to the frame between an initial position that is substantially horizontal and a wrapping position that is slated from the horizontal,

one of the said snubbers being provided with an elongated opening therein,

the cross extension comprising means to normally bias the cross extension to the said initial position;

a severing tool means transversely secured in the frame adjacent to the cross extension to sever the film,

the severing tool means being protected by a film snubber when the cross extension is in its initial position,

the severing tool means being exposed through the elongated opening when the cross extension is pivoted to the wrapping position;

a rocker arm pivotally mounted upon the frame, the rocker arm comprising a free end that is rotatively movable about the frame from an initial position to a wrapping position,

the rocker arm comprising spring means to normally bias the free end toward the initial position,

the wrapped package pivoting the free end to the wrapping position by overcoming the bias of the spring means; and

heat panel means secured to the free end of the rocker arm to receive the package and to thermally weld the film when contacted by the film wrapped package,

portions of the film simultaneously contacting the heat panel means and the severing tool means when the rocker arm free end is pivoted to the said wrapping position;

whereby the film about the wrapped package will simultaneously be thermally welded by the heat panel means and other portions of the film will be simultaneously cut by the severing tool means.

4,524,560

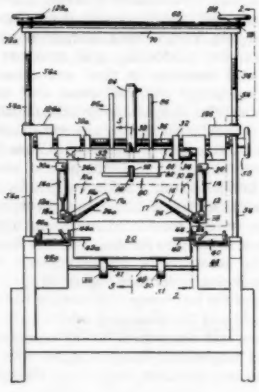
CASE TOP FOLDER AND FLAP SUPPORTER

James A. Goodman, Glencoe, Ill., assignor to Prototype Equipment Company, Deerfield, Ill.

Filed Sep. 3, 1982, Ser. No. 414,638

Int. Cl.³ B65B *7/20*

U.S. Cl. 53—374 **11 Claims**



1. Apparatus for closing a case of the type having a first pair of opposed top flaps and a second pair of opposed top flaps, said second pair of opposed top flaps being dimensioned to define a slot between the outer edges thereof when in closed position, comprising:

means for folding each first flap inwardly to a closed position;

means for folding each second flap inwardly over and in firm contact with the surface of each folded first flap; and

means for supporting each said first flap through the slot

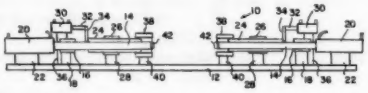
between said second flaps while in said closed position so as to prevent substantial movement thereof because of said second flaps being folded into contact therewith, whereby said first and second flaps are supported in said closed position so that the engaged surfaces of said first and second flaps are adapted to be joined to close said case.

4,524,561

METHOD AND APPARATUS FOR PACKAGING SHEATHED TUBULAR STRANDS

J. Alfons F. Liekens, Olen, and Ivo G. M. Hendriks, Overpelt, both of Belgium, assignors to Teepak, Inc., Oak Brook, Ill.

Division of Ser. No. 331,404, Dec. 16, 1981, Pat. No. 4,484,679.
This application Aug. 8, 1984, Ser. No. 638,817
Int. Cl.³ B65B *19/00, 51/24, 53/02*
U.S. Cl. 53—397 **11 Claims**



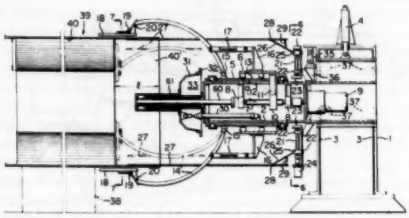
7. A method of wrapping a compressed casing strand, said method comprising the steps of telescoping a tubular wrap over a casing strand with the wrap having end portions extending beyond ends of the casing strand, supporting the so wrapped casing strands at opposite ends thereof by opposed supports partially entering ends of the casing strand and defining inner mold members, heating the wrap end portions to effect an initial shrinkage of the wrap end portions in a radially inward direction, and then axially compressing and folding the heated wrap end portions towards ends of the casing strands and about said inner mold members to define rigid end caps at the ends of the casing strand integral with the tubular wrap.

4,524,562

METHOD AND APPARATUS FOR MAKING A CYLINDRICAL PACKAGE FOR STEEL STRIP COIL

Yoshio Yagi; Toshihiko Kondo; Norio Matsubara; Shoichiro Miyazaki; Hajime Kashiyama, and Makoto Shibata, all of Kitakyushu, Japan, assignors to Yuwa Sangyo KK, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,445
Claims priority, application Japan, Dec. 14, 1981, 56-203225
Int. Cl.³ B65B *7/14, 11/54, 25/24*
U.S. Cl. 53—409 **6 Claims**



1. A method of using an apparatus for wrapping with a sheet of wrapping material different sized cylindrically shaped coils of steel strip having a cylindrical peripheral surface, two end surfaces and a hollow cylindri cal central space, said apparatus having a cylindrical member having a horizontal axis mounted on a frame and projecting therefrom, a horizontal rotatable member rotatably mounted on said cylindrical member for rotation therearound, a plurality of arms having their base ends mounted on the periphery of said rotatable member and having free ends extending beyond the end of said cylindrical member away from said frame and movable in a path from a position corresponding to the outer peripheral surface of the largest size coil to be wrapped to a position near the center of the smallest size coil to be wrapped, a plurality of pusher plates, one pivotably mounted on the free end of each of said arms at a point along the length of the pusher plate adjacent the end thereof closer to said cylindrical member and pivotable between a rest position substantially parallel to the axis of said cylindrical member to a position substantially perpendicular to said axis, spring means connected to each of said pusher plates for pivotally urging each of said pusher plates to said rest position, and

a plurality of pleat forming rods on said apparatus extending parallel to the axis of said cylindrical member with a pleat forming rod midway between each pair of adjacent pusher plates, said pleat forming rods being movable radially of the axis of said cylindrical member, said method comprising:

wrapping a sheet of the wrapping material around the cylindrical peripheral surface of the coil to be wrapped with the ends of the sheet projecting beyond both ends of the coil a distance which is greater than the thickness of the coil between the peripheral surface and the hollow space;

moving the apparatus to a position opposed to the end of the coil and moving said arms for moving the ends along said path until said pusher plates are brought into contact with the outer peripheral surface of the wrapper around the coil at a position where a substantial portion of the length thereof is against the wrapper on the peripheral surface of the coil and the pivotal mounting point of said plates is spaced axially away from the end surface of the coil toward said cylindrical member;

inserting the plurality of pleat forming rods into the inside of one projecting end of the wrapping material in a direction parallel to the cylindrical axis of the coil, and bringing the pleat forming rods into contact with the inside of the projecting end of the wrapping material;

moving said arms further for further moving said pusher plates for pivoting the pusher plates around said points from their parallel position to the perpendicular position against the coil end surface while they remain substantially in contact with the wrapper and the corner of the coil to draw the wrapper over the corner of the coil and fold it against the end surface of the coil and causing the pleat forming rods to form radial pleats in the wrapping material; and

moving said arms circumferentially of the end of the coil for sliding the pusher plates circumferentially of the end surface of the coil for flattening all the pleats against the end surface in the same direction.

4,524,563

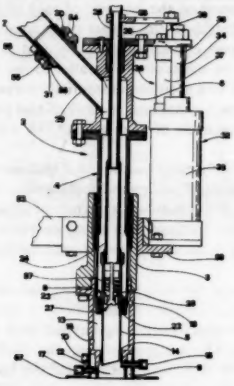
PROCESS AND PLANT FOR ASEPTIC FILLING OF PRE-STERILIZED, NON-RIGID CONTAINERS

Carlo Sassi, Parma, Italy, assignor to Tito Manzini & Figli S.p.A., Parma, Italy

Filed Dec. 10, 1981, Ser. No. 329,294
Int. Cl.³ B65B *3/16, 7/06, 43/26, 43/36*
U.S. Cl. 53—426 **19 Claims**

1. A process for aseptic filling of pre-sterilized, non-rigid containers comprising attaching a workhead to the outer surface of a small portion of the container, sterilizing the outer surface of the small portion and the attached parts of the workhead, piercing the small portion of the container, introducing sterile gas into the container through the pierced portion, introducing a feeder tube through the pierced portion, introducing foodstuff into the container through the feeder tube while permitting sterile gas to be expelled from the container

through the pierced portion, terminating the flow of foodstuff into the container, withdrawing the feeder tube, hermetically



sealing the container, separating the workhead from the container, and cleaning the workhead.

4,524,564

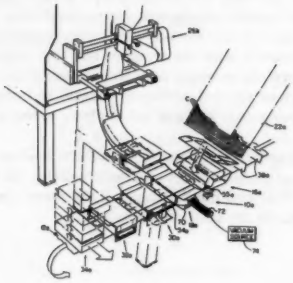
CARTONING METHOD

James S. Groom, Wales, Mass., and Robert W. McIntyre, Kennewick, Wash., assignors to Package Machinery Company, East Longmeadow, Mass.

Division of Ser. No. 123,824, Feb. 22, 1980, Pat. No. 4,358,918. This application Aug. 30, 1982, Ser. No. 413,170

Int. Cl.³ B65B *5/04, 35/28*

U.S. Cl. 53—449 **3 Claims**



1. A method for making a bag-in-carton package including a carton sleeve, a bag, and a product contained within the bag, and comprising the steps of depositing a carton sleeve within a sleeve confining receptacle, conveying the confined carton sleeve to a filling station and aligning the open near end of the confined carton sleeve with a constricting bag guide at the carton filling station, delivering a bag containing a product to a vacuum belt conveyor, applying vacuum to the belt conveyor to hold the bag in engagement with the belt conveyor, advancing the belt conveyor to accelerate the bag through the bag guide at a rate sufficient to cause shifting of the product within and relative to the bag, interrupting the applied vacuum to release the bag from the conveyor as the bag enters the near end of the carton sleeve, applying vacuum to the far end of the carton sleeve to draw the bag into the sleeve, and arresting movement of the bag when the bag is wholly disposed within the carton sleeve.

4,524,565

PACKING CONTAINER FOR PRESSURIZED CONTENTS AND A METHOD FOR MANUFACTURING THE SAME

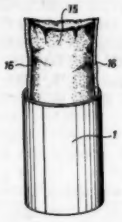
Lars-Erik Palm, Staffanstorp, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Jun. 7, 1983, Ser. No. 501,914

Claims priority, application Sweden, Jun. 17, 1982, 8203763

Int. Cl.³ B65B *31/02*

U.S. Cl. 53—449 **8 Claims**



1. A method for the manufacture of a packing container for pressurized contents having an outer casing and a liquid-tight inner container, the method comprising the steps of introducing the inner container and its contents into the outer casing, through open ends provided in said outer casing, the outer casing circumferentially enclosing the inner container in a non-gastight manner, placing end plates at the open ends of the outer casing, vibrating the packing container so as to promote the contents to give off gas and expand the inner container to force out any air present in the outer casing, and sealing the end plates in a gas-tight manner to the outer casing after release of the gas and after the inner container has expanded.

4,524,566

PACKAGING MACHINE

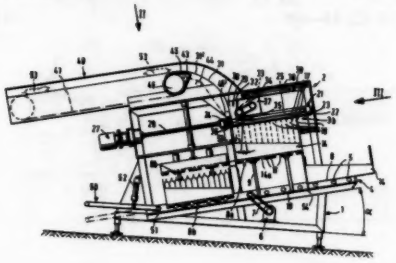
Manfred Hauers, Viersen, and Walter Baur, Grüindau, both of Fed. Rep. of Germany, assignors to Rovema Verpackungsmaschinen GmbH & Co. KG, Fernwald, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,171

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113045

Int. Cl.³ B65B *35/24, 35/44*

U.S. Cl. 53—534 **12 Claims**



1. In a packaging machine for introducing individual packages into a container, including a feed mechanism for feeding the individual packages to means defining a passage, a magazine with plural compartments for receiving the individual packages therein and from said passage, said magazine compartments being constructed as chutes which are open on both top and bottom, means for moving said container to and from said magazine, said means for moving said container including a liftable and lowerable container support for said container being arranged below said magazine, said container being

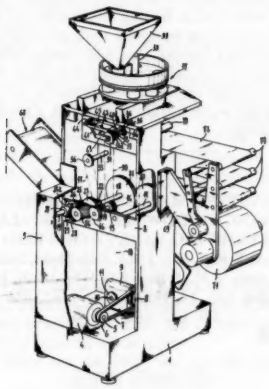
guided from below toward said magazine by raising said container support, the improvement comprising wherein said container is moved up to receive said magazine therein and to close off the bottom of said chutes, wherein support means are provided for supporting said feed mechanism and said magazine for relative movement with respect to each other, wherein said container support is divided into two support parts which can be raised and lowered independently, namely into a first support part which lies below said passage for said individual packages and a second support part adjacent the first support part, and wherein said container is moved, during the course of its being filled, from the first support part to the second support part.

4,524,567

MACHINE FOR MAKING, FILLING AND SEALING BAGS

Ferruccio Patelli, Bologna, Italy, assignor to MAPA - Società Per Azioni, Bologna, Italy

Filed Aug. 31, 1982, Ser. No. 413,235
Claims priority, application Italy, Sep. 11, 1981, 3524 A/81
Int. Cl.³ B65B *9/12*
U.S. Cl. 53—552 **3 Claims**



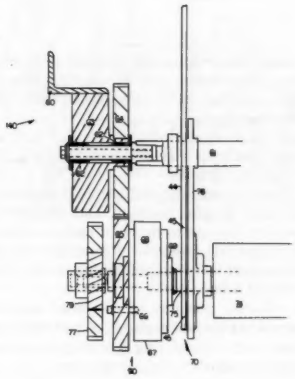
1. In a machine for making, filling and sealing bags, the latter being obtained from a band of material which is heat-sealable in the usual manner, and filling them with liquid, pulverulent, or granular and other noncoherent products, which comprises an operating structure extending in the vertical direction and including base, a vertical mandrel tube on said base and a profiling collar disposed around said mandrel tube to form a drawing device, means for supporting a reel of heat-sealable material and for conveying said material from top to bottom through the aforesaid annular space between said profiling collar member and said mandrel tube, folding said material in tubular form around and along said vertical mandrel tube with two longitudinal edges superimposed, metering means for a product to be packed disposed above the vertical mandrel tube, advancing means below said profiling collar member and in contact with the said mandrel tube for pulling said band downwards along said vertical mandrel tube, heat-sealing means disposed along said mandrel tube for the heat-sealing of the said superimposed longitudinal edges of the band and below said mandrel tube transversely to the tube of heat-sealable material thus obtained, and means adapted to operate said heat-sealing means in a cyclic phase, the improvement wherein said advancing means and the said heat-sealing means for heat-sealing transversely to the tube of heat-sealable material are associated with support means controlled by continuous motion operating means below the said vertical mandrel tube, the advancing means comprising two sector members having cylindrical surfaces and contrarotating tangentially to a plane containing the axis of descent of the said tube of heat-sealable material, the said continuous motion operating means comprising a cyclic differentiator device, said cyclic differentiator device comprising a first gear having helically inclined teeth meshing with a loose gear having corresponding teeth and of greater axial dimension forming part of said continuous motion operating means, a cam member fixed to said first gear, and a second gear, the said first gear and the said cam member being slidably keyed on the shaft on which the said second gear is keyed, a roller carried loose by fixed support means being engaged in the operating groove of said cam member.

4,524,568

POWER ASSISTED ROTATABLE FILM WRAPPING APPARATUS

Patrick R. Lancaster, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Filed Aug. 27, 1982, Ser. No. 411,995
Int. Cl.³ B65B *13/04*
U.S. Cl. 53—556 **25 Claims**



1. An apparatus for making a unitary package using a single web of stretchable plastic material to form an overwrap, comprising: a frame; a dispenser means mounted to said frame, said dispenser means being adapted to hold and dispense a roll of stretchable material; drive means adapted to drive said dispenser means in rotation about a load; elongation means connected to said drive means and adapted to receive and engage stretchable material pulled from said dispenser means, said elongation means comprising at least a downstream roller and an upstream roller interconnected by speed control means; power assistance means coupled to said elongation means and driven by said drive means, said power assistance means comprising power transfer means and predetermined constant torque means adapted to produce a predetermined constant torque, said power transfer means being coupled through said predetermined constant torque means to said elongation means, said power transfer means comprising stationary ring means and friction roller means, said stationary ring means being secured to said frame, said friction roller means being coupled to said predetermined constant torque means and engaging said stationary ring means to rotate said friction roller means during rotation of said dispenser means about said load to provide said predetermined constant torque to said elongation means, said elongation means being driven by said power assistance means and by engagement of the stretchable material pulled from the dispenser means during rotation of the dispenser means about the load, said upstream and downstream rollers being acted upon by said speed control means so that said downstream roller transports said stretchable material

faster than said upstream roller to cause said stretchable material to elongate between said upstream and downstream rollers.

4,524,569

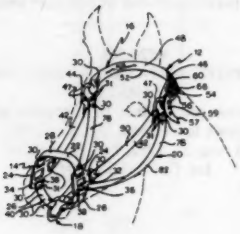
ANIMAL HALTER APPARATUS

Thomas B. Hanna, 1300 Hiram, Wichita, Kans. 67213

Filed Jun. 11, 1984, Ser. No. 619,140

Int. Cl.³ B68B *1/02*

U.S. Cl. 54—24 **7 Claims**



1. An animal halter apparatus adapted to be placed about a head portion of an animal such as a horse, comprising:

(a) a nose support assembly to be placed about a nose portion of subject animal;

(b) a head support assembly secured to said nose support assembly and releasable connected about a top head portion of subject animal;

(c) a control ring assembly to interconnect adjacent portions of said nose support assembly and adapted to receive a control line thereon to move or anchor subject animal;

(d) said control ring assembly of generally bell shape having a main support body integral with a connector section and aligned end portions;

(e) said adjacent portions of said nose support assembly connected to opposed portions of said main support body whereby said control ring assembly cannot rotate thus providing a constant, rigid structure;

(f) a jaw support assembly connected to said end portions of said control ring assembly and said head support assembly; and

(g) said jaw support assembly having first and second jaw strap members interconnected to each other at a section adjacent to said end portions to contact and support a jaw portion of the subject animal in a rearwardly and upwardly inclined manner from said control ring assembly to said head support assembly.

4,524,570

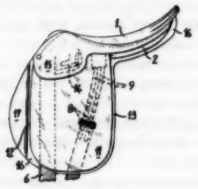
BLANKET-SADDLE FOR SPORTING HORSE-RIDING

Jean-Claude Racinet, 174, Avenue Charles de Gaulle, 92200 Neuilly, France

Filed May 16, 1983, Ser. No. 494,716

Int. Cl.³ B68C *1/02, 1/12*

U.S. Cl. 54—44 **7 Claims**



1. A blanket-saddle for sporting horse-riding, comprising a rigid one-piece seat-tree placed on a saddle blanket and a girthing device formed of two lateral V shaped half-girths, one end of which is fixed to the front of the tree and the other end of which is connected by securing buckles to tabs fixed towards the rear of the tree, the two half-girths being associated with a belly strap of adjustable length having a buckle at each of its ends and each half-girth passing through one of the buckles, in which it may slide for adjusting the girthing, said blanket-saddle having two lateral sections and being provided on each side with a stirrup-leather holder fixed to the front of the tree, wherein the seat-tree has on its lower face an anatomical padding, morphologically adapted to the back of the horse and filling the space between the tree and the back of the horse, over the whole length of the tree situated directly below the rider, so as to better distribute the weight of this rider over the animal and to ensure a good balance of the saddle as well as a perfect connection between the back of the animal, the saddle and the rider, a central recess being hoever formed at right angles to the backbone of the animal, the padding being made from a material which is both supple and resistant, a supple and light flap, thin without being easily creased, being fixed on each side to the tree so as to cover approximately the upper half of the V shaped half-girth, this flap having a substantially rectilinear edge at the front and at the rear, where it does not substantially extend beyond said tabs, the saddle blanket being made from a single piece having dimensions such that it extends beyond the saddle equipped with its supple flaps, over the whole periphery thereof, and said saddle blanket having only at the front of each of its two lateral sections, in the region extending beyond the flap with substantially rectilinear front edge and over the whole height of this flap, a thick outwardly projecting padding.

4,524,571

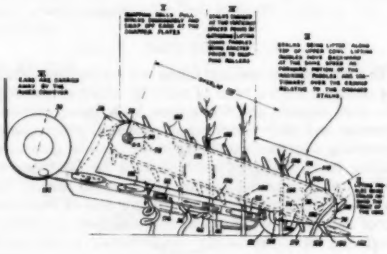
CORN HARVESTER MACHINE WITH MECHANISM FOR PICKING UP DOWNED CORNSTALKS AND RETRIEVING EARS THEREFROM

Randall L. Mak, R.R. 1, Box 138A, Fair Oaks, Ind. 47943, and Larry W. Young, R.R. 2, Box 300, Wheatfield, Ind. 46392

Filed Aug. 15, 1983, Ser. No. 523,046

Int. Cl.³ A01D *45/02*

U.S. Cl. 56—98 **11 Claims**



1. In combination with a harvester having a forward frame with forwardly open throats adapted to receive rows of grain-bearing stalks, pairs of gathering chains and snapping rolls located respectively above and below pairs of horizontally spaced stripper plates in each throat, and a cross conveyor with a forwardly open trough to receive grain from said throats, an improved row divider between each adjacent pair of throats comprising:

a lower cowl fixedly mounted on the frame above the stripper plates; and

an upper cowl having a downwardly concave shape positioned over the lower cowl in substantially co-extensive, nesting relationship therewith, said upper cowl having a rearwardly and upwardly inclined top surface and a curved front nose portion ahead of the lower cowl with ground-engaging support means on the underside thereof

and having a rear end portion connected to the lower cowl for up and down tilting movement about a horizontal tilting axis;

a pair of stalk lifting chains trained between pairs of driving and idler sprockets adjacent the upper side edges of the upper cowl, said driving sprockets being rotatably mounted about said horizontal tilting axis within the rear end portion of the lower cowl and said idler sprockets being rotatably mounted about a horizontal axis in the front nose portion of the upper cowl and tiltably movable up and down therewith about said horizontal tilting axis;

said lifting chains moving forwardly at ground level beneath said front nose portion, upwardly around said nose portion, and rearwardly along the upper sides of the top surface of the upper cowl to the rear end thereof;

substantial stalk-engaging runs of the gathering and lifting chains extending in rearwardly moving, lapping, vertically spaced relationship with one another above and lengthwise of the snapping rolls;

means for driving said stalk-engaging runs of the gathering and lifting chains rearwardly at a speed matching the forward ground speed of the machine enabling said stalk-engaging runs to remain substantially stationary relative to the stalks and the ground while providing continuous vertically spaced supports for holding the stalks upright above the snapping rolls within the throat while the machine advances;

whereby the stalk lifting chains are effective to continuously displace stalks forwardly from beneath the front nose portion, upwardly around the forward end thereof, and hold the stalks upright within the throat and stationary with respect to the ground while the machine moves the upper cowl forwardly to elevate the stalks and hold them erect at vertically spaced locations above the snapping rolls while the stalks are pulled downwardly through the stripping plates to remove the grain therefrom.

4,524,572

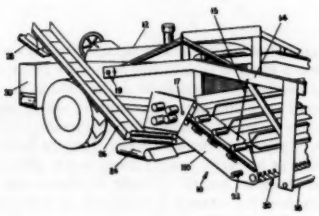
PICKLE HARVESTER

Bernard D. Wilde, 16920 Kenowa, Kent City, Mich. 49330; Gary R. Van Ee, 711 Sherwood, Williamston, Mich. 48895; Richard L. Ledebuhr, 6082 Pheasant St., and C. Alan Rotz, 946 River Knoll, both of Haslett, Mich. 48840

Filed Aug. 18, 1983, Ser. No. 524,306

Int. Cl.³ A01D *45/00*

U.S. Cl. 56—327 R **19 Claims**



1. A harvester attachment especially effective for small cucumbers that is mountable in a frame for a conventional tractor mounted cucumber harvester between the vine cutter and pinch roller mechanism thereof, the attachment comprising a pick-up mechanism that picks up the vines and a conveying and pickle removing means for conveying vines from the pick-up to the pinch roller mechanism and for dislodging pickles from the vines, the conveying and pickle removing means including upper and lower rotating paddle means rotating in the direction of vine movement between the pick-up mechanism and pinch roller mechanism, the paddle means having cushioned blades that convey the vines and strike the cucumbers so as to dislodge them from the vines, the paddles being spaced and synchronized such that the vines are held between the upper and lower paddle means while cucumbers are dislodged from the vines by the rotating paddles, without excessive vine slipping or fruit damage, the harvester including drive means for operating at least a portion of the paddle means at a vine contacting surface speed that is faster than the vine contacting surface speed of the mechanism upstream from said portion of the paddle means such that vines are stretched out and struck by the blades of said portion of the paddle means, the harvester attachment further comprising conveyor means for conveying dislodged cucumbers from the harvester to a storage location.

4,524,573

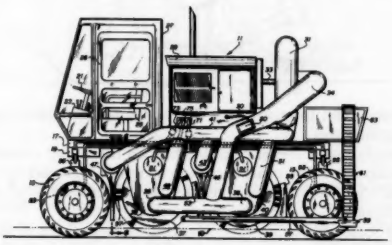
VACUUM FINGER HARVESTER FOR STRAWBERRIES OR THE LIKE

Kinney David J., Star Rte. #2, Ozark, Ark. 72949

Filed Feb. 13, 1984, Ser. No. 579,356

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—330 **18 Claims**



1. A crop harvester comprising

a vehicle having at least two wheels and a body supported thereby,

means for generating a large volume air flow at a vacuum pressure mounted on said vehicle,

a perforated support element on said vehicle body having a closed path of revolution,

means for revolving said element with a peripheral speed approximately equal to that of said wheels,

a plurality of closely spaced open-ended hollow finger elements affixed over the perforations of said support element,

a collector for crop elements adjacent said support element, and

means within said support element for directing air flow through selected ones of said finger elements at said vacuum pressure thereby causing crop elements with desired characteristics to be gathered to the end of said finger elements, separated from the crop plant, and deposited in said collector.

4,524,574

UNDERFED CROP BALER HAVING SINGLE ROTARY FEEDER

Howard J. Ratzlaff, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed May 18, 1984, Ser. No. 611,824

Int. Cl.³ A01D *39/00*

U.S. Cl. 56—341 **8 Claims**

1. A crop baler comprising:

a generally horizontally disposed baling chamber extending in a fore-and-aft direction with respect to the path of travel of the baler;

a plunger mounted for reciprocation within said chamber in said fore-and-aft direction,

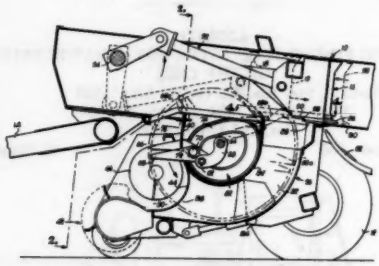
said chamber having an entrance opening in a lower wall

thereof over which said plunger passes during said reciprocation;

a tubular loading duct depending from said chamber with its upper end in direct communication with said opening and having a length which is at least as great as the vertical dimension of said chamber,

said duct curving downwardly and forwardly from said opening and terminating in a forwardmost end defining an open, crop-receiving mouth;

apparatus forwardly of said duct for picking up crop material from the ground as the baler moves along said path of



travel and for presenting the picked up material to said mouth; and

a single rotary feeder operable to load the baling chamber with successive charges of crop materials from said mouth of the duct in timed relation to reciprocation of the plunger,

said feeder including crop-engaging structure which turns through 360 degrees of revolution along a course leading into said mouth, rearwardly through the duct, up into the baling chamber, and back down to the mouth during each cycle.

4,524,575

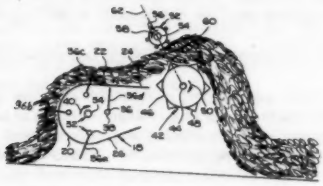
WINDROW AERATOR

Arnold W. Nilsen, Box 20, Hazard, Nebr. 68844

Filed Mar. 12, 1984, Ser. No. 588,496

Int. Cl.[3] A01D *79/02*

U.S. Cl. 56—372 **4 Claims**



1. An implement for producing an aerating effect in hay in a windrow comprising,

a transverse frame mounted on wheels adapted to be drawn along the windrow, with the wheels straddling the windrow, and the frame disposed thereabove,

the implement including operating components mounted in the frame and extending transversely therein and on transverse axes, and encompassed between a leading edge and a trailing edge,

one of the operating components being a pickup head at and forming the leading edge and having a rounded leading surface merging into a flat top surface extending rearwardly therefrom adjacent the horizontal, the pickup head including a rotor having tines operative for picking up the hay in the windrow and moving it up and onto the top surface and operative for extending into the hay on the top surface in generally vertical direction and being withdrawn therefrom in direction linearly of the tines,

a second of the components being a lower roller at the rear of the top surface of the pickup head and extending at least as high as that top surface, and also being disposed at and forming said trailing edge, and

a third of the components being an upper roller positioned generally above and spaced from the lower roller and with a front surface at least as far forward as the front surface of the lower roller,

the pickup head and the lower roller being the only means forming an upwardly directed means for supporting the hay,

the implement including means for driving said components pursuant to the implement being drawn along the windrow,

the upper roller being the only means above said top surface of the pickup head and the lower roller that engages the hay on the upper side of the hay,

the three components mentioned constituting the sole means for conducting hay through the implement, and being operative for picking up the hay from the ground by the pickup head and moving it onto and rearwardly along the top surface, and moving it through the space between the rollers, and over the second roller and moving it therefrom directly onto the ground.

4,524,576

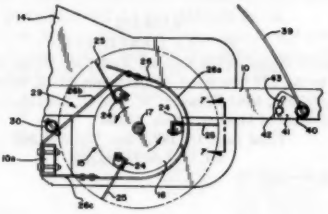
WINDROWED HAY FLUFFING AGRICULTURAL IMPLEMENT

Evan N. Probst, RFD Box 344, Heber, Utah 84032

Filed Mar. 2, 1984, Ser. No. 585,560

Int. Cl.[3] A01D *79/02*

U.S. Cl. 56—372 **13 Claims**



1. In an agricultural implement adapted to be drawn through a field behind a tractive vehicle and especially useful for fluffing cut and windrowed vegetation in the field as such implement is drawn over and along a windrow, which implement includes means forwardly thereof for attachment to a tractive vehicle a rotary pick-up device having elongate teeth extending therefrom in mutually spaced relationship around its periphery and along its length, a frame in which said pick-up device is mounted for rotation transversely of and opposite to the direction of travel of the implement, and means for driving said pick-up device as the implement travels over a windrow, the combination therewith of a series of stationary stripper bars mutually spaced along said pick-up device and being forwardly substantially concentric therewith about substantially a semi-circle, so as to receive said teeth therebetween as the pick-up device rotates, said stripper bars extending rearwardly and sloping upwardly above said pick-up device from said semi-circle and positioned relative to said pick-up device such that the lengths of said teeth projecting therethrough progressively shorten as they are moved rearwardly between said stripper bars for continually propelling the picked-up vegetation upwardly and rearwardly while progressively withdrawing therefrom; and rearward extensions of the respective stripper bars sloping downwardly as a discharge deck for the picked-up vegetation, said teeth continuing to extend through

said discharge deck along substantially the length thereof to propel said vegetation toward the discharge end thereof.

4,524,577
TWISTED YARN

Osamu Ito, Utsunomiya; Harumasa Yamasaki; Itsuo Minakata, both of Wakayama, and Kazunori Nishizawa, Funnbashi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

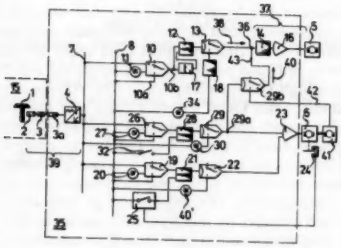
Filed Dec. 10, 1982, Ser. No. 448,555
Claims priority, application Japan, Dec. 18, 1981, 56-204696
Int. Cl.³ D02G *3/02, 3/04, 3/26, 3/28*
U.S. Cl. 57—200 **8 Claims**

1. A twisted yarn prepared by twisting a starting yarn comprising at least 50% by weight of water-insoluble, water-swellable fibers having a degree of water swelling of at least 10 cc/g so that the twist constant of the twisted yarn is at least 2.5, said water-insoluble, water-swellable fibers being hydrolyzed acrylic fibers in which carboxylate groups of the formula —COOX, wherein X is Li, K, Na or NH_4, are present in an amount of 0.7 to 4.0 mmol/g.

4,524,578
APPARATUS FOR CONTROLLING THE THREAD JOINING PROCESS IN AN OPEN END ROTOR SPINNING MACHINE

Hans Raasch, Monchen-Gladbach, and Manfred Lassmann, Nettetal, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,233
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144761
Int. Cl.³ D01H *15/00, 13/18*
U.S. Cl. 57—263 **17 Claims**

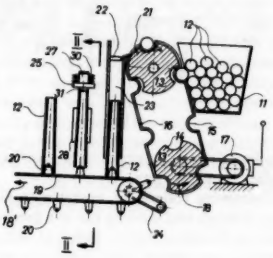


1. Apparatus for controlling a thread joining process which takes place by starting a rotor in an open end rotor spinning machine, comprising at least one spinning unit of the open end rotor spinning machine, means connected to said at least one spinning unit for controlling pre-feeding of a required fiber quantity for thread joining and for controlling fiber feed to the rotor, for return of a joined thread end to the rotor and for at least temporary control of thread unwinding from the rotor during the thread joining process, a thread unwinding device and a sliver drawing-in device connected to said control means at least during the thread joining process, a connection from said control means for pre-feeding to said sliver drawing-in device, and a control element connected in said connection at which a chosen draft for the spinning operation is adjustable.

4,524,579
DEVICE FOR DONNING BOBBINS ONTO A TRANSPORT BAND

Arthur Würmli, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed May 1, 1984, Ser. No. 605,805
Claims priority, application Switzerland, May 6, 1983, 2476/83
Int. Cl.³ D01H *9/18*
U.S. Cl. 57—276 **7 Claims**



1. A device for donning of bobbins onto a transport band of a textile machine, especially a ring spinning or ring twisting machine and for doffing improperly donned bobbins, wherein the transport band is provided with positioning pins serving for positioning of the bobbins and the feed of bobbins to the transport band takes place at a predetermined bobbin loading position, comprising:

a bar member for the removal of damaged bobbins;

means for pivotably mounting said bar member for movement out of a substantially horizontal starting position;

means for subjecting said bar member to a resilient biasing action urging said bar member back towards said substantially horizontal starting position;

means for moving said bar member upwardly and downwardly at a bobbin monitoring position arranged after the bobbin loading position with respect to a predetermined direction of movement of the transport band, in order to doff bobbins incompletely mounted over a positioning pin of the transport band; and

said moving means acting upon said bar member such that said bar member is movable at an end portion thereof, during its downward movement, towards a bobbin head of the bobbin currently located at the bobbin monitoring position, in order to effectuate doffing of a bobbin incompletely mounted over a positioning pin by the downwardly moving bar member with pivoting of the bar member into a position forming an acute angle α with respect to the lengthwise axis of said incompletely mounted bobbin.

4,524,580
APPARATUS FOR MAKING A YARN FROM A ROVING

Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

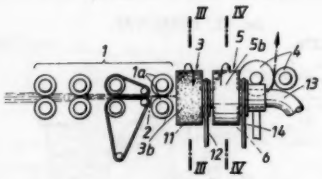
Filed Apr. 29, 1983, Ser. No. 490,032
Claims priority, application Austria, Dec. 10, 1982, 4493/82
Int. Cl.³ D01H *1/135, 7/882*
U.S. Cl. 57—401 **9 Claims**

1. In apparatus for making a yarn from a roving, comprising twisting and winding means for twisting a drawn roving so as to form a twisted roving having protruding fiber ends and for winding said protruding fiber ends around said twisted roving, and

withdrawing rollers for withdrawing a yarn made from said roving,

the improvement residing in that

said twisting and winding means comprises a twisting device for twisting said drawn roving so as to form a twisted roving having protruding fiber ends and a winding device which is separate from said twisting device and operable to wind said protruding fiber ends around said twisted roving,



said winding device comprises sliding surfaces defining and bounding a guiding gap,

said withdrawing rollers are operable to pull said twisted roving through said guiding gap in a predetermined direction of travel and in contact with said sliding surfaces, and

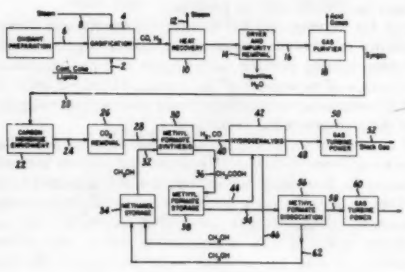
said guiding gap tapers transversely to said direction of travel.

4,524,581

METHOD FOR THE PRODUCTION OF VARIABLE AMOUNTS OF POWER FROM SYNGAS

Ronald F. Cascone, and C. Ashley Solomon, both of New York, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,758
Int. Cl.³ F02C *3/28*
U.S. Cl. 60—39.02 **27 Claims**



1. A process for satisfying a variable power demand comprising:

gasifying a substantially combustible hydrocarbonaceous material into a syngas possessing a CO/H_2 ratio ranging from about 3 to 1 to 1 to 3;

preparing the syngas for reacting to form a liquid CO absorbing molecule product;

reacting the prepared syngas with a suitable feed to form a liquid CO absorbing molecule product in a synthesis zone;

separating the liquid CO absorbing molecule product and passing it to a first storage zone;

passing the unreacted H_2 rich syngas from the synthesis zone to a power producing zone;

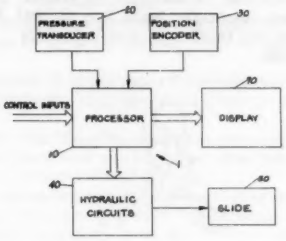
passing the CO storing molecule product from the storage zone for use as a fuel source during peak demand periods.

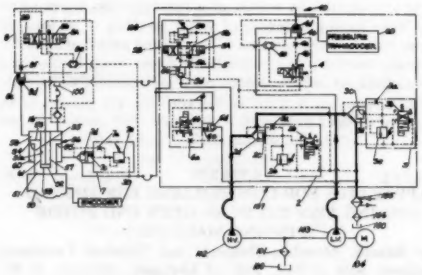
4,524,582

CONTROL SYSTEM FOR HYDRAULIC PRESSES

Delbert E. Lucas, Fairfield, Ohio, and Stephen J. Lieland, Lawrenceburg, Ind., assignors to Cincinnati Incorporated, Cincinnati, Ohio

Filed Mar. 31, 1983, Ser. No. 480,720
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—421 **19 Claims**





1. A control system for controlling the movement of the slide of a hydraulic press of the type having a main cylinder, a piston in said cylinder, a slide for applying tonnage to a workpiece, said piston mounting said slide, workpiece contacting tool means on said slide, at least one volume in said cylinder above said piston and a volume in said cylinder below said piston, a reservoir for hydraulic fluid to activate said main cylinder, a hydraulic circuit between said main cylinder and said reservoir for supplying hydraulic fluid under pressure to said cylinder to shift said piston and slide upwardly and downwardly, and a high volume pump and a low volume pump to supply hydraulic fluid under pressure from said reservoir to said hydraulic circuit, said control system comprising an electronic processor having inputs and outputs to control said hydraulic circuit in accordance with a preprogrammed routine, a pressure transducer positioned to measure and provide an output representative of the pressure of hydraulic fluid supplied to said cylinder by said hydraulic circuit to shift said piston and slide downwardly and thus representative of the tonnage applied by said slide against a workpiece, a position encoder coupled to said slide to provide an output indicating the vertical position thereof, said outputs of said pressure transducer and said position encoder being connected to the inputs of said processor, and said hydraulic circuit comprising a plurality of cartridge valves having control means actuable by outputs of said processor, said hydraulic circuit also including a cartridge valve between said volume below said piston and said reservoir serving as a counter-balance valve to maintain a threshold pressure in said volume below said piston to support the weight of said piston, slide, and tool means, said counter-balance cartridge valve being controlled by hydraulic fluid pressure directed to and exiting from said volume below said piston, and a prefill poppet valve between said at least one

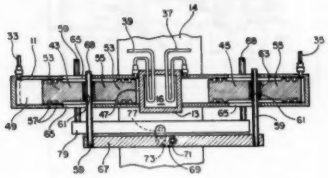
volume above said piston and said reservoir said prefill poppet valve being controlled by hydraulic pressure both below and above said piston.

4,524,583

STIRLING ENGINE

Karl J. Scheibengraber, 6025 W. Spencer Pl., Milwaukee, Wis. 53218

Filed Oct. 31, 1983, Ser. No. 547,114
Int. Cl.³ F02G *1/00*; F16H *21/22*
U.S. Cl. 60—525 **14 Claims**



1. Apparatus for converting the direction of motion, such as converting reciprocating motion to rotary motion comprising:

(a) a frame;

(b) at least one cylinder mounted to the frame and defining a first axis, the cylinder having at least one longitudinal slot in the periphery thereof;

(c) a piston adapted to reciprocate within the cylinder along said first axis, the piston having a transverse aperture therethrough coinciding with the cylinder slot;

(d) a piston rod having a longitudinal axis and extending through the piston aperture and cylinder slot transversely with respect to said first axis;

(e) a cross bar yoke for fixedly receiving the ends of at least two piston rods, the yoke having a journal therein; and

(f) a crankshaft mounted for rotation in the frame about a second axis which is offset from said first axis and perpendicular to said first axis and to the piston rod longitudinal axis and having a crank throw journaled in the yoke,

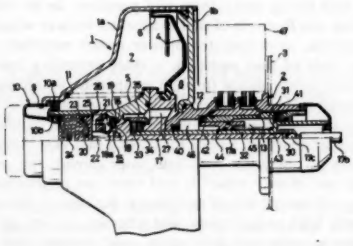
so that the reciprocating motion of the piston transmitted to the piston rod produces sliding motion of the piston rod through the piston transversely to the first axis for rotating the crank shaft.

4,524,584

BRAKE BOOSTER

Michio Kobayashi, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,554
Claims priority, application Japan, Sep. 22, 1982, 57-165604; Sep. 27, 1982, 57-167851
Int. Cl.³ B60T *13/00*
U.S. Cl. 60—554 **10 Claims**



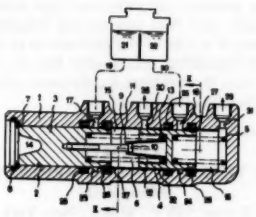
5. A brake booster comprising a power piston having a shank portion, said power piston being slidably disposed within a shell including a front shell portion and a rear shell portion, a valve mechanism received within a valve body which is defined by the shank portion of the power piston, a constant pressure chamber and a variable pressure chamber defined forwardly and rearwardly respectively, of the power piston as viewed in the direction of operation thereof, a master cylinder connected to the rear shell adjacent to the variable pressure chamber, an input shaft extending through the master cylinder for cooperation with the valve mechanism, a supply passage for supplying a fluid pressure to the valve mechanism through the front side of the power piston, and an output shaft for providing a mechanical inteconnection between the power piston and the piston of the master cylinder, wherein the valve mechanism includes a first valve seat formed on the valve body, a second valve seat formed on the input shaft and a valve head urged in a direction from the front side toward the rear side of the power piston to seat against the first and second valve seats, and in which the output shaft is slidably disposed in surrounding relationship with the input shaft, the output shaft comprising front and rear portions respectively closely and loosely surrounding said input shaft and connected by a radial step separating a chamber of the master cylinder from an annular open space to the rear of said step, and means defining an axial lost motion connection between said input and output shafts and having at least a part thereof located in said open space to the rear of said radial step.

4,524,585

SHORT MASTER-CYLINDER

Juan V. Coll; Joan S. Bacardit, and Joaquim F. Bofill, all of Barcelona, Spain, assignors to Bendiberica /S.A., Barcelona, Spain

Continuation of Ser. No. 283,392, Jul. 15, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,284
Claims priority, application Spain, Jul. 30, 1980, 494,697
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **11 Claims**



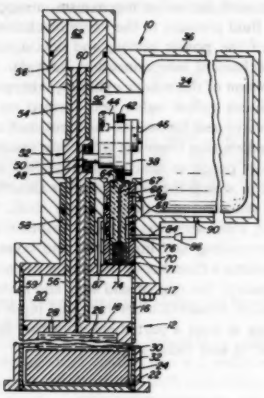
1. A brake master cylinder comprising a primary piston and a secondary piston sliding within a cylindrical housing to form two pressure chambers which communicate respectively with two brake circuits via outlet orifices and two hydraulic fluid feed reservoirs, these latter communications occurring through two compensation passages open to the chambers, respectively, in an idle position, and characterized by the pistons each having smooth lateral surfaces slidably engaging a housing interior wall and movable relative to fixed sealing rings fastened in annular grooves of the housing interior wall, and that one outlet orifice of one of the pressure chambers communicates with longitudinal grooves formed each with a width less than the circumference of said housing interior wall and in the housing interior wall in such a way that communication is maintained between the one outlet orifice and the one pressure chamber regardless of the position of the pistons in front of or overlapping the one outlet orifice, to enable reduction of the overall length of the master cylinder.

4,524,586

CRYOGENIC REFRIGERATOR

Jack E. Jensen, Columbus, Ohio, assignor to CVI Incorporated, Hilliard, Ohio

Filed Apr. 9, 1984, Ser. No. 597,983
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **5 Claims**



1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid path between the first chamber and the second chamber by movement of the displacer means, chamber means for guiding a slide connected to the displacer means, a motor connected to said slide for reciprocating said slide, a valve having a reciprocable valve member for controlling the flow of high and low pressure fluid, said valve member having a peripheral groove, said motor being arranged to move said valve member in timed relation with movement of said slide so that the valve member will introduce high pressure fluid via said groove into said first and second chambers when the displacer means is at one of the extremities of its movement, and means for controlling said flow so that the flow from the groove to or from the displacer is correlated with the pressure difference across said valve.

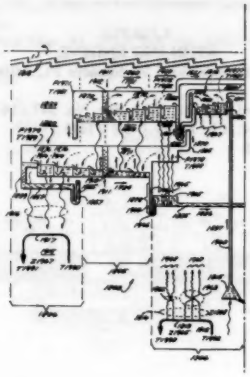
4,524,587

ROTARY THERMODYNAMIC APPARATUS AND METHOD

Frederick W. Kantor, 523 W. 112 St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 456,709, Jan. 10, 1983, Pat. No. 4,441,337, which is a division of Ser. No. 240,135, Mar. 31, 1981, Pat. No. 4,367,639, which is a continuation of Ser. No. 4,606, Jan. 18, 1979, abandoned, which is a division of Ser. No. 770,316, Feb. 18, 1977, Pat. No. 4,136,530, which is a division of Ser. No. 569,478, Apr. 18, 1975, Pat. No. 4,010,018, which is a continuation of Ser. No. 78,552, Oct. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828. This application Apr. 9, 1984, Ser. No. 598,366
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—101 **38 Claims**

1. An absorptive rotary inertial thermodynamic device operable as a gas-flow driven heat pump in which heat is transferred from a lower temperature heat source to a higher temperature heat sink, comprising gas-flow driven heat pump means having a low pressure portion in which heat received directly or indirectly from said source evolves a volatile component as a gas from an absorbent liquor to concentrate said liquor and a high-pressure portion in which heat delivered to said sink is produced by absorption of the gas into the concentrated liquor; means supplying said gas at a relatively high pressure to said high-pressure portion of the gas-flow driven heat pump means; and means accepting said gas at a low pressure from said low-pressure portion of the gas-flow driven heat pump means.

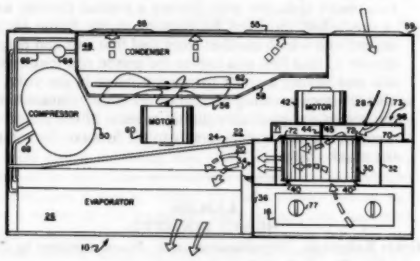


4,524,588

AIR CONDITIONER WITH IMPROVED FRESH AIR PATH

Ralph W. Bond, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Nov. 21, 1983, Ser. No. 553,664
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—262 **12 Claims**

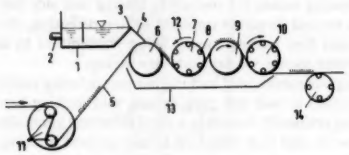


1. An air conditioner comprising a partition separating outside fresh air from room air, an evaporator blower wheel positioned on the room air side of said partition, said evaporator blower wheel having a first side facing said partition and a second side facing away from said partition, an air chamber separating said first side of said evaporator blower wheel from said partition, an evaporator blower motor mounted on the fresh air side of said partition, a shaft extending from said evaporator blower motor through an aperture in said partition and through said air chamber to said evaporator blower wheel, a vent in said partition communicating from said outside fresh air to said air chamber, a door for closing said vent wherein, in one mode of operation with said door closed, the only air entering said blower wheel is said room air recirculating by entering said second side of said blower for passage through an evaporator back to said room, and wherein, in a second mode of operation with said door open, said outside fresh air is drawn through said vent into said chamber entering said first side of said evaporator blower wheel, said outside fresh air mixing with said recirculation air in said evaporator blower wheel for passage through said evaporator to said room.

4,524,589
APPARATUS FOR FROTH PROCESSING OF LENGTHS OF MATERIAL

Heinz Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Basel, Switzerland

Filed Dec. 1, 1981, Ser. No. 326,279
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045644; Jan. 17, 1981, 3101337
Int. Cl.³ D06B 1/06, 1/14, 23/00
U.S. Cl. 68—5 D 47 Claims

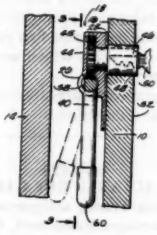


1. An apparatus for foam dyeing of lengths of textile material having pile fibers on a pile side thereof, comprising a dye liquor applicator for applying a foamable liquid-dye liquor to the pile side of said textile material, a stroking means arranged after the dye liquor applicator along a travel path of said textile material for alternately compressing and releasing the dye-containing pile fibers to cause the dye to foam on the pile fibers, said stroking means being arranged to directly contact the pile side of the textile material and being driven to rotate and to provide a relative motion between said textile material and said stroking means and means for conveying the textile material along said travel path in contact with said stroking means so that the stroking means is partially encompassed by said textile material.

4,524,590
DOOR LATCH WITH LOCK

Joseph D. Budish, 1635 Madison Ave., South Milwaukee, Wis. 53172

Filed Sep. 23, 1982, Ser. No. 421,970
Int. Cl.³ E05B 65/06
U.S. Cl. 70—129 4 Claims



1. A latch for a door installation including first and second doors having inner and outer faces and mounted in spaced facing relationships for movement relative to each other between open and closed positions, said latch comprising:

a support bracket including a base adapted to be mounted on the inner face of the first door between the first and second doors;

an elongated bolt having an outer end portion, said bolt being carried by said support bracket for relative rotational movement between a sliding position and a locking position angularly displaced from said sliding position and for relative slidable movement between a latched position wherein, when the first door is closed, said outer end portion is received in a keeper located adjacent the first door to prevent opening of the first door, and an unlatched position wherein said outer end portion is retracted from the keeper to permit opening of the first door, said bolt including a longitudinally extending rack having a length corresponding to the longitudinal movement of said bolt between the latched and unlatched positions and a recessed portion angularly displaced from said rack;

an elongated handle affixed on said bolt and extending transversely therefrom for rotating said bolt and for moving said bolt between the latched and unlatched positions and the sliding and locking positions, said handle having a length greater than the spacing between the first and second doors, whereby during attempted rotational movement of said handle and said bolt in a direction from the locking position toward the second door with the second door closed, said handle engages the face of the second door to prevent movement of said bolt to the sliding position;

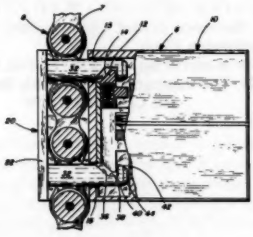
movable lock means operable from the outer face of the first door;

actuation means operable in response to movement of said lock means including a pinion which engages said rack when said bolt is in the locking position to prevent longitudinal movement of said bolt without moving said lock means and to permit longitudinal movement of said bolt between the latching and unlatched positions in response to movement of said lock means, said pinion being aligned with said bolt recessed portion when said bolt is in the sliding position to permit free longitudinal movement of said bolt between the latching and unlatched positions.

4,524,591
LOCK DEVICE FOR CHAIN DRIVEN VEHICLES

Richard I. Lanka, 28952 Homewood Dr., Wickliffe, Ohio 44092

Filed Dec. 30, 1982, Ser. No. 454,857
Int. Cl.³ E05B 67/22
U.S. Cl. 70—236 2 Claims



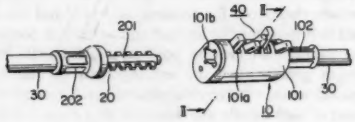
1. A locking device of the type adapted to engage the links of a drive chain of a vehicle, such as a bicycle, motorcycle, moped of the like, comprising a lock mechanism having a hollow housing mounting a key actuated tumbler means having a locking arm means adapted to be moved between a locked and an unlocked position, said housing having a pair of oppositely disposed openings adapted to provide ingress and egress into the housing, a locking plate member including a flat base plate portion and an integral downwardly depending side plate portion defining an L-shaped configuration in side elevation providing a protective outer skirt, at least one elongated locking pin element made integral with and extending downwardly from said base plate portion and parallel to said side plate portion and spaced laterally from said side plate portion, said locking pin element having a recessed slot adapted to receive therein the confronting end portion of said locking arm of said lock mechanism.

4,524,592

COMBINATION LOCK

Hisashi Saitoh, Aichi, Japan, assignor to Saikosha Works Ltd., Kasugai, Japan

Filed Feb. 23, 1983, Ser. No. 469,067
Claims priority, application Japan, Feb. 26, 1982, 57-27268[U]
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—287 **12 Claims**



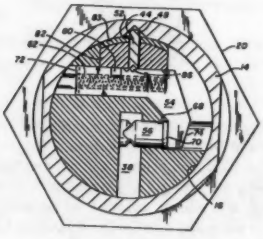
12. A combination lock comprising a housing having an inner chamber, window means arranged in said housing, said housing having an end wall, a key opening in said end wall, said housing having an inner portion defining at least a partial internal cylindrical surface, a plurality of dials each having at least a partial outer cylindrical surface, said dials being rotatably supported in said housing by the mating and engagement of said internal and outer cylindrical surfaces, said dials having outer levers extending through said window means to provide for manual rotation of said dials, said dials each having an inner bore with a slot, said dials being rotatable to an unlocked position in which said slots are axially aligned, said dials being rotatable to a locked position in which said slots are non-axially aligned, and key means inserted through said key opening into said inner bore of said dials, said key means having projections slidable in said axially aligned slots when said dials are in said unlocked position, said dials engaging said projections to preclude axial withdrawal of said key means when said dials are in said locked position, whereby the number of parts are minimized in that the dials which engage said key means to effect locking and unlocking are rotatably supported by said internal cylindrical surface of said housing.

4,524,593

SIDE BAR LOCK WITH ENHANCED PICK RESISTANCE

Thomas F. Hennessy, Bristol, Conn., assignor to Lori Corporation, Southington, Conn.

Continuation-in-part of Ser. No. 231,777, Feb. 15, 1981, Pat. No. 4,404,824. This application Jul. 5, 1983, Ser. No. 510,613
Int. Cl.³ E05B *27/06*
U.S. Cl. 70—358 **12 Claims**



1. A lock which is operated by a key having at least a first detent provided a surface thereof comprising:

housing means;

key plug means rotatably mounted within said housing means, said key plug means being provided with a keyway;

at least first pin tumbler means, said pin tumbler means being reciprocally mounted in said key plug means and having a pin portion which is partly complementary in size and shape to the key detent, said pin tumbler means normally extending into said keyway, said pin tumbler means being directed out of said keyway upon contact with the detented key, said pin tumbler means unlocked position being determined by engagement of the pin portion thereof with the key detent;

at least first side bar means, said side bar means being slidably mounted in said key plug means, said side bar means being in contact with said pin tumbler means, said side bar means being moved in a first direction by said pin tumbler means when said pin tumbler means engages the detented key, said side bar means having a first edge portion;

first biasing means for resiliently biasing said side bar means in a second direction opposite to first direction, the action of said first biasing means being transmitted to said pin tumbler means via said side bar means;

locking bar means, said locking bar means being reciprocally mounted in said key plug means, said locking bar means being resiliently biased in a third direction generally transverse to said first direction to engage said housing means and prevent the rotation of said key plug means, a first portion of said locking bar means being juxtapositioned to said first edge portion of said side bar means when the lock is in the locked condition whereby the application of rotational force to said key plug means will establish contact between said locking bar means first portion and said side bar means thereby preventing said locking bar means from moving in a fourth direction opposite to said third direction to disengage said locking bar means from said housing means;

true gate means, said true gate means being provided in said side bar means first edge portion, said true gate means being placed in aiignment with said locking bar means first portion when said side bar means is moved to the unlocked position by engagement of said pin plug means in a key detent of proper size and depth, said true gate means being sized and shaped to receive said locking bar means first portion to thereby allow said locking bar means to move in said fourth direction and disengage from said housing means;

false gate means, said false gate means being provided in said side bar means first edge portion, said false gate means being at least in part located to the side of said true gate means which is between said true gate means and a point on said side bar means first edge portion which is aligned with said locking bar means with the lock in the locked condition, said false gate means including at least a first cut-out in said side bar means first edge portion, said first cut-out having side walls which are convergent toward the bottom thereof, and

second biasing means for resiliently biasing said locking bar means in said third direction.

4,524,594

RETRACTABLE KEY CARRIER

Jacques Bascou, Maule, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 9, 1983, Ser. No. 473,748
Claims priority, application France, Mar. 9, 1982, 82 03910
Int. Cl.³ A44B *15/00*; A45C *11/32*; A47G *29/10*
U.S. Cl. 70—456 R **9 Claims**

1. A key carrier comprising:

a hollow case having a first opening;

a hollow drum having first and second ends, said hollow drum mounted in said case adjacent said first opening such that said first and second ends of said drum are enclosed by said case, said drum having a second opening and being rotatably mounted about a first axis, whereby said drum may be rotated such that said first and second openings are in alignment;

a pin mounted in said drum to define a second axis perpendicular to said first axis;

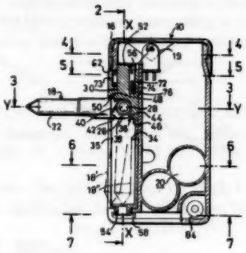
a key pivotally mounted on said pin for movement between

a first position wherein said key is positioned in said drum, and a second position wherein said key extends out of said drum;

first means for biasing said key into said second position;

second means for biasing said drum such that said first and second openings are out of alignment; and

means for permitting manual rotation of said drum,



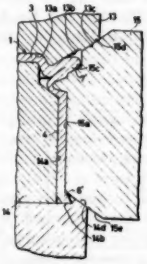
whereby said key is retained in said first position by said case when said first and second openings are biased out of alignment by said second biasing means, wherein rotation of said drum by said manual rotation means such that said first and second openings are in alignment permits said first biasing means to move said key into said second position, and wherein said second biasing means moves said first and second openings out of alignment when said key is returned to said first position.

4,524,595

METHOD OF MANUFACTURING SHEET METAL MADE POLY-V PULLEYS

Misao Oda, Hyogo, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan

Filed Sep. 19, 1983, Ser. No. 533,749
Int. Cl.³ B21D *53/26*
U.S. Cl. 72—84 **7 Claims**



1. A method of manufacturing sheet metal poly-v pulleys, comprising the steps of:

forming a cup-shaped blank having a peripheral wall and an end wall joined at a connecting portion;

pre-forming a lug between the end wall and the peripheral wall by pressing the end wall and peripheral wall toward one another around the connecting portion between the end wall and the peripheral wall such that inside surfaces of the end wall and the peripheral wall are pressed into contact, said lug forming at least a part of an uppermost V-groove;

after said preforming step, pressing a corrugating roller against the peripheral wall from outside the blank to bring the wall into a corrugated shape having ridges alternating with grooves on an outer surface of said peripheral wall, the corrugating roller also pressing against said uppermost V-groove;

axially compressing the peripheral wall while keeping the corrugating roller inserted in the respective grooves, thereby forming poly-v grooves of predetermined spacing; and,

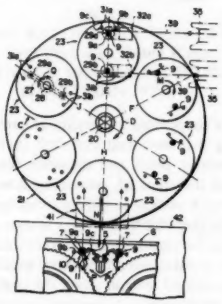
finishing the grooves by pressing a finish forming roller in the grooves.

4,524,596

METHOD OF FORMING AND FEEDING TORSION SPRINGS

Yuzo Tsunekawa, and Takashi Tomizawa, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 18, 1983, Ser. No. 543,000
Claims priority, application Japan, Oct. 22, 1982, 57-185828
Int. Cl.³ B21F *3/04*
U.S. Cl. 72—133 **2 Claims**



1. A method of feeding torsion springs to a system which uses the torsion springs, each torsion spring having a coiled portion and straight ends, the method comprising:

providing at least one winding means, having a spindle with an axis, for forming a torsion spring by winding a wire about said spindle;

providing a transfer means for transferring the torsion spring from said winding means to a spring feeding position in which the torsion spring is fed to a spring inserting means for inserting the torsion spring into a system which uses the torsion spring, while maintaining the torsion spring in a predetermined orientation during said transfer from the winding machine to the spring feeding position, said transfer means having at least one spring support pin having an axis and an associated pair of spring retainer pins;

forming a torsion spring by winding a wire about said spindle;

delivering the so-formed torsion spring to the transfer means by axially aligning said spindle and said spring support pin and moving the torsion spring in the axial direction from the spindle to the spring support pin so that the coiled portion of the torsion spring receives therein the spring support pin and the ends of the torsion spring are held in place by respective spring retainer pins.

4,524,597

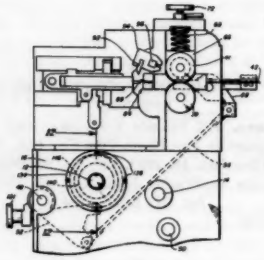
METHOD OF SUPPORTING A CAMSHAFT IN A WIRE COILING MACHINE

Frank S. Russell, Northboro, and Robert J. Simonelli, Grafton, both of Mass., assignors to Sleeper & Hartley Corp., Worcester, Mass.

Division of Ser. No. 497,756, May 25, 1983, which is a continuation of Ser. No. 251,194, Apr. 6, 1981, Pat. No. 4,402,204, which is a continuation-in-part of Ser. No. 201,204, Oct. 27, 1980, Pat. No. 4,372,141. This application Jun. 4, 1984, Ser. No. 617,342

Int. Cl.³ B21F *3/02*

U.S. Cl. 72—135 **4 Claims**



1. A method of supporting a plurality of cams on a camshaft of a wire coiling machine, said camshaft including cams for controlling respective pitch and diameter tools, of said machine comprising the steps of, providing a wire coiling machine having a work station at which a coil spring or the like is formed, feeding the wire to the work station, supporting the camshaft, driving the camshaft using non-circular gear means to effect variable speed camshaft rotation, securing the cams to the camshaft in a spaced fashion along the camshaft with each cam being in a predetermined position, providing a housing means having an opening for receiving the camshaft, said opening being of greater diameter than the cam maximum diameter, providing a support member having a bearing surface for the camshaft and secured to the housing means about the housing means opening to cover said opening, removing the support member from the housing, withdrawing at least the cams from the camshaft through the opening in the housing, repositioning the cams at the same predetermined position for the purpose of subsequently forming the same spring configuration, and resecuring the suport member to the housing.

4,524,598

METHOD OF ROLLING A SIMULATED HOLE IN SHEET METAL WITHOUT DRILLING OR PUNCHING

Neal E. Rowe, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1983, Ser. No. 540,067

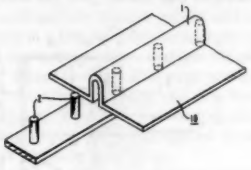
Int. Cl.³ B21B *1/08*; B21D *53/36*

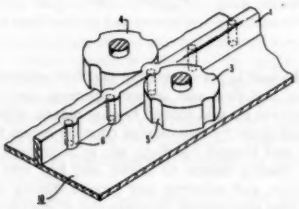
U.S. Cl. 72—198 **4 Claims**

1. A method of providing a simulated hole in sheet metal that is adapted to receive and serve as an anchorage means for a screw type fastener, which method comprises:

(a) roll forming an upstanding U-shaped loop segment of a predetermined depth in the sheet metal to match the length of a selected size of said fastener, said loop segment having a closed end and being wider than the diameter of the selected fastener;

(b) inserting a removable pin inside the loop segment at a medial position therealong where the simulated screw hole is desired and orienting the pin so that the inserted end faces the closed end of the U-shaped loop segment;





(c) crimping the loop segment of the sheet metal to close the metal around the removable pin and also close the parts of said loop segment that are adjacent to and located on either side of the pin; and then

(d) removing the pin from the sheet metal loop segment to thereby provide the desired simulated hole and fastener-anchoring means in the sheet metal.

4,524,599

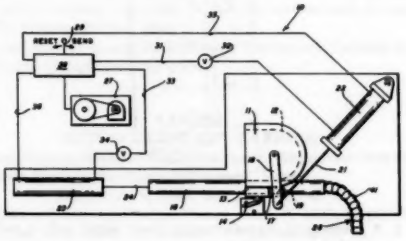
ROTARY COMPRESSION BENDING MACHINE

Gregory W. Bailey, 48 Center St., Torrington, Conn. 06790

Filed Sep. 27, 1982, Ser. No. 423,676

Int. Cl.³ B21D *9/03, 9/05*

U.S. Cl. 72—321 **6 Claims**



1. A rotary compression bending machine for bending thin wall tubing comprising:

a radius die having a concave radius around the working perimeter thereof,

a clamp die for securing a length of tubing in engagement with the radius die,

a wiper die mounted adjacent the working perimeter of the radius die for movement in an arcuate path therealong,

a flexible ball mandrel comprising a plurality of spherical balls adapted to be positioned within the portion of the tubing which is to be bent, and

means for driving said wiper die in an arcuate path in a first direction around the working perimeter of the radius die to bend said tubing therearound and for simultaneously drawing said flexible ball mandrel in an opposite direction through said tubing, at least one of said spherical balls being positioned with said tubing at the location on said tubing where said bend is taking place, whereby the motion of said flexible ball mandrel within said tubing reforms the tubing wall by burnishing to produce a bend in said tubing which is smooth and wrinkle free.

4,524,600

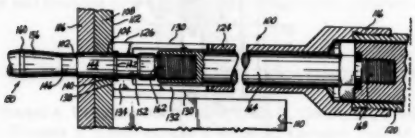
APPARATUS FOR PRESTRESSING FASTENER HOLES

Robert L. Champoux, 2539 128th SE., Bellevue, Wash. 98005, and Charles M. Copple, 13713 SE. 237th Pl., Kent, Wash. 98031

Division of Ser. No. 347,717, Feb. 10, 1982, Pat. No. 4,471,643. This application Jan. 26, 1984, Ser. No. 574,011

Int. Cl.³ B21D *31/00*

U.S. Cl. 72—391 **7 Claims**



1. For use as a pull gun extension and sleeve retainer, wherein said pull gun is adapted for pulling a mandrel axially through a one piece prestressing sleeve within a fastener hole in a workpiece, so that varied diameter portions of the mandrel exert expansion forces on the sleeve, to cause the sleeve to be expanded radially and prestress the metal around the fastener hole, and in that manner improve fatigue properties of the metal; said extension and sleeve retainer comprising:

an elongated generally tubular member having an inner and an outer end, and a generally central passageway therethrough;

means on the inner end for securing the member to the pull gun;

a multiple of annularly spaced, axially directed alternate splits and fingers extending axially inwardly from the outer end to positions outwardly of the inner end;

adjacent fingers normally being closely adjacent along axially directed surfaces along the splits at their outer ends;

the passageway being formed along inner annular surfaces of the fingers which are configured to be radially engaged at their outer ends with a mandrel when the mandrel extends therethrough and when it is being retracted through the sleeve in the fastener hole; and

axially and radially directed means formed adjacent the outer end extending around the passageway to engage the end of the sleeve to axially retain it in a fastener hole when the mandrel is being retracted through the sleeve and to prevent the sleeve from entering the passageway.

4,524,601

AUTOMATIC APPARATUS FOR DOWNSETTING LEAD FRAME STRIPS

Carl E. Bernardi, 3048 Bayberry La., San Jose, Calif. 95148

Filed May 13, 1983, Ser. No. 494,385

Int. Cl.³ B21D *43/00*

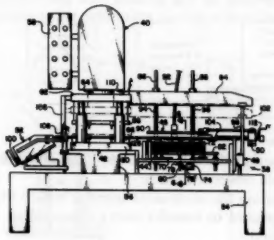
U.S. Cl. 72—422 **37 Claims**

1. An automatic apparatus for loading objects into a die set prior to a forming operation and for unloading said objects from said die set subsequent to said forming operation, where said forming operation includes sequential steps of closing and opening said die set by a punch press and said die set includes a fixed die portion and a moveable punch portion, said apparatus comprising:

a support base to support said die set and said punch press;

guide rails means attached directly to said fixed portion for guiding said objects into said die set;

placing means attached directly to said moveable punch portion for placing one of said objects onto said guide rail means;



advancing means for transferring said one of said objects along said guide rail means into said die set;

positioning means for positioning said one of said objects within said die set; and

unloading means coupled to said advancing means for transferring said one of said objects out of said die set.

4,524,602

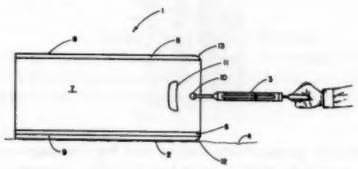
ACCIDENT RECONSTRUCTION DEVICE

Milton D. Moore, 2268 Park Cir., Baton Rouge, La. 70819

Filed Mar. 7, 1984, Ser. No. 587,052

Int. Cl.³ G01N *19/02*

U.S. Cl. 73—9 **6 Claims**



1. An accident reconstruction device, comprising:

(a) an elongated metal body, I-shaped in section, having upper and lower flanges with corresponding flat upper and lower surfaces, said flanges being connected by a web having a hole through said web at one end, said hole positioned at the vertical center of mass of said body;

(b) a flat friction surface affixed to and substantially covering said lower surface of said lower flange; and

(c) a scale means, attachable to said hole, for pulling said body and indicating the force required to pull said body.

4,524,603

METHOD OF IMPACT TESTING MOTOR VEHICLES

Ashok B. Hargunani, Farmington Hills, Clifford C. Chou, Canton, and Harold G. Brilmyer, Grosse Pointe, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 6, 1983, Ser. No. 529,821

Int. Cl.³ G01N *3/30;* **G01M** *17/00*

U.S. Cl. 73—12 **4 Claims**

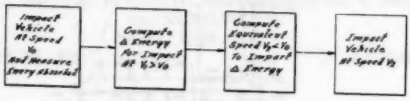
1. A method of determining the deflection characteristics of a vehicle resulting from subjecting the vehicle to impact with a flat, stiff barrier at a plurality of given speeds, the method comprising the steps of:

A. subjecting the vehicle to a first such impact at a first speed;

B. measuring the deflection characteristics of the vehicle after said impact;

C. computing the observed energy absorbed by the vehicle as a result of said impact;

D. computing the predicted energy to be absorbed by the vehicle through such an impact at a second, higher speed;


Impact Vehicle At Speed V0 And Measure Energy Absorbed
Compute Δ Energy For Impact At V1>V0
Compute Equivalent Speed V0+V0 To Impart Δ Energy
Impact Vehicle At Speed V2

E. computing the difference between said predicted energy and said observed energy;

F. computing the equivalent speed at which the vehicle must be impacted to transfer energy equivalent to said difference; and

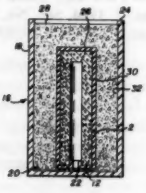
G. subjecting the vehicle to such impact at said equivalent speed.

4,524,604

CONCRETE PERMEABILITY TESTING DEVICE AND METHOD

Gary L. Vondran, 1905 Quail Meadow Rd., Los Altos, Calif. 94022

Filed Feb. 25, 1983, Ser. No. 469,831
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **10 Claims**



6. A concrete permeability testing unit for forming a concrete test specimen with a cylindrical cavity comprising a concrete permeability testing core form means mounted axially concentric in a surrounding cylindrical mold having a bottom surface, the concrete permeability testing core form means comprising a cylinder of polymeric foam which will at least partially collapse when contacted with a solvent for the polymer, the cylinder having a side surface and first and second end surfaces, the side surface and first end surface of the cylinder being enclosed within a layer of an elastomeric polymer resistant to said solvent for the polymer foam, the elastomer polymer being under tension, the second end surface of the core means being affixed to the bottom surface of the cylindrical mold.

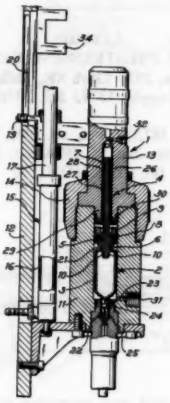
4,524,605

POROSIMETER WITH DETECTION BY CAPACITY VARIATIONS

Pietro Italiano, Cernusco S/Naviglio, and Ermete Riva, Merate, both of Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Oct. 27, 1983, Ser. No. 545,947
Claims priority, application Italy, Nov. 4, 1982, 24076 A/82
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **13 Claims**

1. An apparatus for porosimetric measurements by recording capacity variations in a cylindrical condenser, said apparatus comprising a porosimeter penetrometer for housing a sample to be analyzed, said penetrometer including a capillary with a capillary wall having an outer surface and an inner surface, with said inner surface defining a predetermined inner diameter for said capillary, whereby when mercury is contained in said capillary, said mercury forms a variable inner armature for said condenser; and a porosimeter autoclave body for housing said porosimeter penetrometer, said porosimeter autoclave body including a fixed outer armature for said condenser mounted thereon, said fixed outer armature being



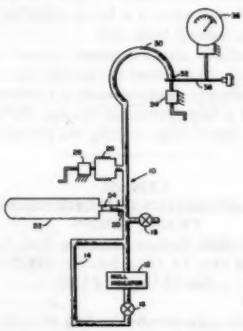
mounted such that, when said penetrometer is housed in said porosimeter autoclave body, a uniform spacing is provided between said fixed outer armature and said capillary inner surface and a space is provided between said fixed outer armature and said capillary outer wall, whereby an oil having a dielectric constant the same as the dielectric constant of the capillary wall may be introduced into said space and said oil and said capillary wall can form a condenser dielectric for said condenser.

4,524,606

LOW FLOW CALIBRATOR

William J. McMahan, 8602 Hickory Hill La., Huntsville, Ala. 35802, and John M. Ball, 12032 Chicamauga Trail, Huntsville, Ala. 35803

Filed Jan. 23, 1984, Ser. No. 572,785
Int. Cl.³ G01M *3/26*; G01F *25/00*
U.S. Cl. 73—40 **2 Claims**



1. A low flow calibrator comprising a manifold structure defining a closed system with two ends therein and having an

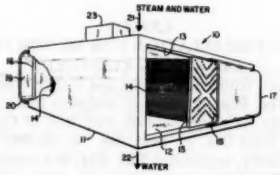
opening connected to a standard leak source, a valve connected into said manifold system for opening said manifold system to atmospheric pressure when desired and for closing and sealing off said system, a differential pressure transducer connected into said manifold system at one end and passage means connecting opposite sides of said differential pressure transducer to the closed system, valve means in said passage means for opening and closing said passage means to allow the same pressures to opposite sides of the differential pressure transducer when desired, adjustable bellows means connected into said closed system for varying the volume of said closed system as desired, a bourdon tube connected into said closed system at the other end, and being movable to vary the volume of said closed system, mechanical adjusting means mounted relative to a closed end of said bourdon tube for moving said closed end of said bourdon tube to increase the volume in said closed system, and a precision dial indicator mounted relative to said mechanical adjusting means for said bourdon tube, means for actuating said dial as said mechanical adjusting means moves said closed end of said bourdon tube, whereas said precision dial indicator indicates the amount of movement of said bourdon tube to enable one to calibrate a standard leak.

4,524,607

SYSTEM AND METHOD FOR LOCATING LEAKING TUBES

Charles A. Pelletier, Bethesda; William E. Gonso, Jr., Fredrick; Douglas S. Cameron, and Patrick R. Leonard, both of Gaithersburg, all of Md., assignors to Science Applications International Corporation, La Jolla, Calif.

Filed Apr. 5, 1982, Ser. No. 365,369
Int. Cl.³ G01M *3/22*
U.S. Cl. 73—40.5 R **18 Claims**



7. A method for detecting and locating leaks from among a plurality of tubular members extending through a chamber and accessible at the opposite ends thereof from outside said chamber, there being a first process fluid communicating through said tubular members and a second process fluid communicating through said chamber, comprising the steps of releasing tracer fluid into one end of a predetermined group of tubular members while maintaining the flow of said first process fluid through all of said tubular members, then sampling said second process fluid in said chamber for the presence of said tracer fluid, then, if said sampling step reveals the presence of said tracer fluid, sequentially releasing tracer fluid into each of said tubular members of said predetermined group and sampling said second process fluid in said chamber after each such release for the presence of said tracer fluid, thereby locating which of said tubular members is leaking.

4,524,608

GAS LEAK METER

David T. Bellefeuille, 19623 E. Batavia Dr., Aurora, Colo. 80011, and Robert S. Beckwith, 2765 S. Colorado Blvd., Denver, Colo. 80222

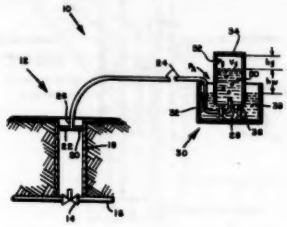
Filed Dec. 5, 1983, Ser. No. 558,255
Int. Cl.³ G01M *3/08*
U.S. Cl. 73—40.5 R **10 Claims**

1. A gas leak meter, said gas leak meter removably attached to a valve box containing a leaking gas valve therein, said gas leak meter comprising:

means for blocking the escape of leaking gas from said valve box, said means for blocking removably attached to said valve box, said means for blocking having therein a hole for channeling said leaking gas,

a flexible tube, said tube fixedly attached to said hole in said means for blocking,

means for collecting said leaking gas at atmospheric pressure, said means for collecting having a first chamber with



an open end exposed to said atmospheric pressure, said means for collecting having a second chamber having a closed top end, said first and said second chambers communicating through operably connected lower ends, said tube operably connected to allow said leaking gas to collect in said second chamber, said second chamber completely filled with a fluid before said leaking gas enters therein, and

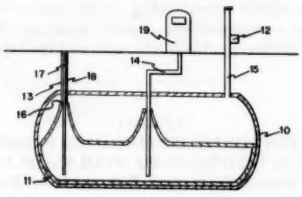
means for timing, said timing means providing a period of time during which said leaking gas partially fills said second chamber.

4,524,609

STORAGE TANK SYSTEMS

Bruce R. Sharp, 4090 Rose Hill Ave., Cincinnati, Ohio 45229

Continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned. This application Feb. 16, 1984, Ser. No. 580,800
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.2 **28 Claims**



1. A liquid storage tank system comprising:

(a) an outer tank shell having rigid walls fitted with a fill pipe, a dispensing line and a vent pipe;

(b) a bladder adapted for fitting within the outer tank shell to hold the liquid, said bladder having openings with means for sealed connection with the fill pipe, dispensing line and vent pipe or points at which the fill pipe, dispensing line and vent pipe enter the outer tank shell;

(c) gas permeable material positioned between the bladder and the walls of the outer tank shell;

(d) vacuum means in communication with the space occupied by the gas permeable material; and

(e) an analyzer in communication with the space within the inner walls of the rigid tank shell and the outside of the bladder.

4,524,610

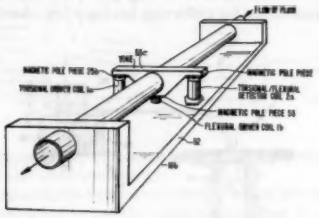
IN-LINE VIBRATORY VISCOMETER-DENSITOMETER

J. Vincent Fitzgerald, Metuchen; Frank J. Matusik, Piscataway, and Donald W. Nelson, Voorhees, all of N.J., assignors to National Metal and Refining Company, Ltd., Edison, N.J.

Filed Sep. 2, 1983, Ser. No. 528,744

Int. Cl.³ G01N *11/16*

U.S. Cl. 73—54 **24 Claims**



22. An in-line vibratory viscometer, comprising:

a transducer having:

a tube extending elasticity, through which a fluid may flow

means for securing first and second longitudinally spaced sections of said tube to provide oscillation nodes at said sections,

a transverse yoke secured to a third section of said tube intermediate said first and second sections thereof,

drive means comprising means operatively associated with said yoke for exciting and maintaining torsional oscillation of said tube between said nodes, and

detector means for detecting said torsional oscillation;

first circuit means connected between said drive means and said detector means for providing a torsional oscillation mode control signal to said drive means to maintain said tube in torsional oscillation at substantially the natural frequency thereof and at a predetermined constant amplitude; and

second circuit means coupled to said drive means and said detector means for providing a viscosity-density product output signal indicative of the viscosity-density product of any fluid within said tube, said viscosity-density product output signal corresponding to the power required to sustain a predetermined angular amplitude of torsional mode oscillation of said tube with said fluid therein.

4,524,611

RHEOMETER FOR MEASURING HIGH PRESSURE AND HIGH TEMPERATURE WITH SAMPLING

Dominique Richon, Rosny. Sous. Bois, and Henri Renon, Paris, both of France, assignors to Association pour la Recherche et le Developpement des Methodes et Processus Industriels (ARMINES), Paris, France

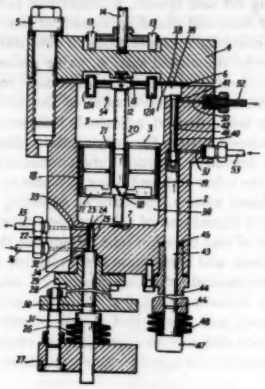
Filed May 10, 1983, Ser. No. 493,411

Claims priority, application France, May 11, 1982, 82 08160

Int. Cl.³ G01N *11/14*

U.S. Cl. 73—59 **12 Claims**

1. A rheometer, including a hollow body (2) with an inner chamber (3), a cap (4) for closure of the hollow body (2), a vertical inner shaft (9), a rotor (18) mounted on the inner shaft (9), and means for rotating the inner shaft (9) via a torque measuring means, characterized in that said inner chamber (3) comprises a lower zone (3A) constituting a fixed measuring cylinder, and an upper zone (3B) having an enlarged diameter with respect to the lower zone (3A), and having a height at least equal to that of said rotor (18), said rotor (18) being displaceable in a longitudinal direction along said inner shaft (9) between an upper position in which said rotor (18) is located in said upper zone (3B) and a lower position in which



said rotor (18) is located in said lower zone (3A) for effecting a measurement.

4,524,612

TESTING INSTALLATION FOR MOTOR VEHICLE OPERATING ELEMENTS

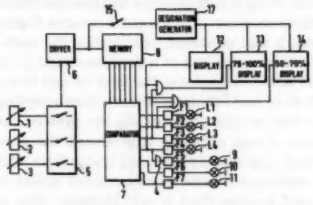
Fritz Bourauel; Wolfgang P. Flohr, and Walter Weishaupt, all of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,458

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247858

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.3 **30 Claims**



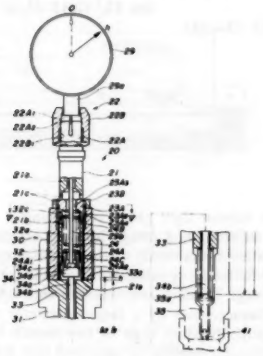
1. A test installation for motor vehicle operating elements which change compared to a starting condition and which, upon reaching an individual limit condition, trigger a common indicating means, comprising means forming an equal number of change intervals from the changes of the operating elements, said change intervals following one another and extending up to the respective limit condition, indicating means respectively coordinated to the change intervals of the operating elements, and control means for triggering the respective indicating means by that operating element which first reaches the limit of its change interval.

4,524,613

ADJUSTING DEVICE FOR ADJUSTING INITIAL INJECTION LIFT OF A DOUBLE INJECTION TYPE FUEL INJECTION VALVE

Kazuo Uchida, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,940
Claims priority, application Japan, Dec. 13, 1982, 57-188318[U]
Int. Cl.³ G01M 15/00
U.S. Cl. 73—119 A 6 Claims



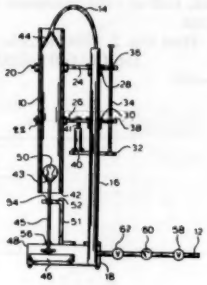
1. An adjusting device for a double-injection fuel injection valve of the type having a nozzle needle, a first nozzle spring, a first movable spring seat coupled to said nozzle needle for lifting together with said nozzle needle and supporting said first nozzle spring, a second nozzle spring, a second movable spring seat supporting said second nozzle spring, a seat held stationary at a predetermined axial location in said fuel injection valve, on which said second movable spring seat is seatable, a shim interposed between said second movable spring seat and said seat and maintaining said second movable spring seat in a position seated on said seat spaced from said first movable spring seat in a seated position thereof by a predetermined gap determining a desired initial injection lift of said nozzle needle, and a hollow member accommodating at least said second nozzle spring, said adjusting device being used to adjust said predetermined gap, said adjusting device comprising: a hollow tubular holder for holding a measuring instrument having an elongate probe, said holder having a through hole formed therein along an axis thereof for said elongate probe to extend therethrough; support means provided at one end portion of said holder for supporting said measuring instrument; mounting means provided at an axially intermediate portion of said holder for mounting said holder on said hollow member of said fuel injection valve while allowing axial displacement of said holder relative to said hollow member; and urging means provided in said through hole of said holder at another end portion of said holder for urging said second movable spring seat of said fuel injection valve against said seat to hold said second movable spring seat in close contact with said seat; said support means, said mounting means and said urging means being so constructed as to permit free axial movement of said elongate probe of said measuring instrument therethrough.

4,524,614

TENNIS BALL EVALUATOR

Carl V. Leunig, Glenmont, N.Y., and Michael F. Susi, Windsor, Conn., assignors to Tex-Tech Industries, Middletown, Conn.

Filed Oct. 5, 1983, Ser. No. 539,081
Int. Cl.³ G01M 9/00
U.S. Cl. 73—147 7 Claims



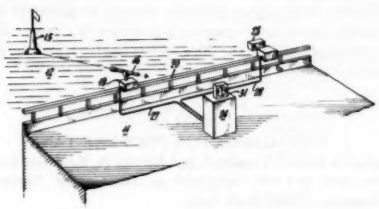
1. A tennis ball evaluator comprising:
a tube;
means for supporting a tennis ball within said tube;
means for causing a gas to flow through said tube to generate a drag force on said tennis ball; and
a scale operatively connected to said supporting means for determining said drag force.

4,524,615

METHOD AND SYSTEM FOR MEASURING THE SPEED OF A SHIP

Paul F. Curran, and Hubert T. Marshall, II, both of Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,585
Int. Cl.³ G01C 21/10
U.S. Cl. 73—181 11 Claims



1. Method of measuring speed of a ship relative to a body of water through which it is being propelled, comprising the steps of:
placing a free floating buoy on said body of water beside said ship,
tracking said buoy from a location on said ship above the surface of said body of water,
measuring the height of said location above said water surface during said tracking,
measuring the vertical angle at said location between the horizontal and said buoy during said tracking,
measuring the horizontal angle at said location between a plane parallel to the center line of said ship and said buoy during said tracking, and
periodically calculating the relative position X of said buoy along a line parallel to the center line of said ship and determining elapsed time Δt between said periodical cal-

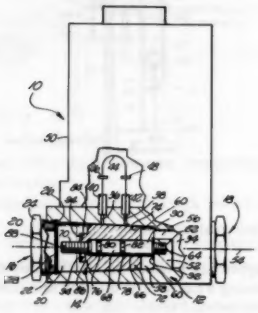
culations whereby said speed may be determined from the relationship $V_x = \Delta X/\Delta t$ where V_x is the velocity at the end of said elapsed time.

4,524,616

ADJUSTABLE LAMINAR FLOW BYPASS

Charles F. Drexel, Rolling Hills Estates, and Richard F. Blair, Long Beach, both of Calif., assignors to Tylan Corporation, Carson, Calif.

Filed Sep. 2, 1983, Ser. No. 529,057
Int. Cl.³ G01F 5/00
U.S. Cl. 73—203 **11 Claims**



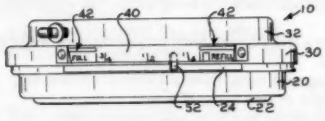
1. A flowmeter comprising an elongate housing having a fluid inlet, a fluid outlet and a longitudinal bore therebetween, a portion of said bore comprising a frusto-conical, longitudinally tapering wall including a flow restrictor within said bore portion, said flow restrictor comprising a conical frustum supported by a threaded axial spindle disposed in the housing, having a perimeter essentially parallel to at least a portion of the tapering wall and capable of forming an annular conduit therebetween capable of maintaining laminar flow of said fluid, and being longitudinally adjustable to modify the thickness of said conduit; and means for measuring the rate of fluid flow, said means including an elongate conduit in operative association with the annular conduit and means for connecting the elongate conduit with the bore within the length of the annular conduit.

4,524,617

FUEL GAUGE FOR PROPANE TANK

Charles A. Krehel, Trumbull, and George N. Kaniwec, Southington, both of Conn., assignors to The Cooper Thermometer Company, Middlefield, Conn.

Filed Oct. 6, 1983, Ser. No. 539,475
Int. Cl.³ A47J 37/08; G01F 23/20
U.S. Cl. 73—296 **9 Claims**



1. A fuel gauge for indicating the level of fuel in a liquid propane-type fuel tank comprising:

a base mounting a weighing means to measure the weight of an object including an angularly positionable indicator, the angular position of which indicator is indicative of weight;

a cover mounted to said base and forming a weighing platform for said weighing means, said base and cover cooperating to form a housing means to generally enclose said weighing means;

locator means to locate and secure a propane-type fuel tank on said weighing platform;

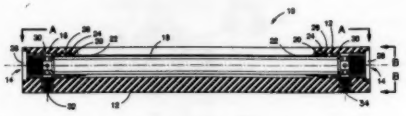
indicia means at the exterior periphery of said housing means forming a circumferentially extending scale, said indicator being angularly alignable with pre-established positions of said scale so that the level of fuel in a propane tank mounted on said weighing platform is indicated by the position of said indicator relative to said scale.

4,524,618

GLASS SIGHT GAUGE FOR HIGH PRESSURE VESSEL

H. Leon Mullis, 1701 W. Easton Ct., Tulsa, Okla. 74127

Filed Mar. 2, 1984, Ser. No. 585,389
Int. Cl.³ G01F 23/02
U.S. Cl. 73—323 **3 Claims**



1. A tubular sight gauge comprising:

(a) an elongated gauge housing adapted to attach to the exterior of a vessel wherein said gauge housing contains a cylindrical opening passing longitudinally through said gauge housing and wherein said cylindrical opening is characterized by a larger diameter at each end of said gauge housing than in the middle thus defining larger diameter regions at each end and a smaller diameter region therebetween wherein said smaller diameter region of said opening is adapted to accept a glass sight tube of element (b) and wherein said large diameter regions are in fluid communication with the interior of the vessel and wherein said cylindrical opening is further characterized by abruptly tapering down to said smaller diameter slightly larger than the glass sight tube in a region displaced inward from each end of said gauge housing and wherein at least one side of said gauge housing, substantially between said regions of abrupt change in diameter, is open thus visually exposing a significant portion of the glass sight tube;

(b) a glass sight tube within said cylindrical opening in said elongated gauge housing wherein said glass sight tube extends from substantially within said large diameter region at one end of said gauge housing through said smaller diameter region including passing through said regions of abrupt change in diameter and visual side opening therebetween terminating substantially within said larger diameter region of said other end;

(c) a pair of tube rings concentrically positioned on said glass sight tube substantially near each end of said sight tube such as to extend from within said larger diameter region through said region of abrupt diameter change and substantially into said side opening of said gauge housing and wherein each of said tube rings contain a rigid concentric shoulder on the outermost end of said tube ring that occupy the space between the outside diameter of said glass sight tube and the inside diameter of of the larger diameter region and wherein each of said rigid concentric shoulders makes contact with said region of abrupt change in diameter on one side and makes contact with an O-ring of element (d) on the other side;

(d) a pair of O-rings each seated against said rigid concentric shoulder on one of said tube rings and occupying the space between the outside diameter of said glass sight tube and the larger diameter region;

(e) a pair of end caps each sealing the larger diameter openings at each end of said gauge housing; and

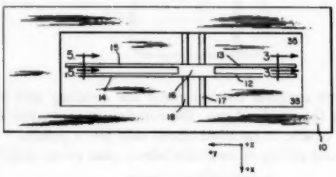
(f) a pair of tube spacers each in contact with the end of said glass sight tube of said end cap such as to limit longitudinal movement of said glass sight tube within said cylindrical opening in said elongated gauge housing and wherein said tube spacers are adapted to allow for fluid communication between said larger diameter region and the interior of said glass sight tube.

4,524,619

VIBRATORY ANGULAR RATE SENSOR SYSTEM

Juergen H. Staudte, Anaheim, Calif., assignor to Piezoelectric Technology Investors, Limited, Laguna Hills, Calif.

Filed Jan. 23, 1984, Ser. No. 572,783
Int. Cl.³ G01C *19/56*
U.S. Cl. 73—505 **2 Claims**



1. A vibratory angular rate sensor system comprising:
(a) a mounting frame of substantially rectangular configuration having a substantially rectangular opening, said frame consisting of a piezoelectric material of Z-cut crystalline quartz;
(b) a first pair and a second pair of tines disposed in said opening, said first pair forming vibrating drive tines, vibrating toward and away from each other, and said second pair of tines forming vibrating output tines, vibrating in opposite directions up and down;
(c) a stem interconnecting said first and second pair of tines, the tines of each pair being disposed parallel to each other and corresponding tines of both pairs being disposed along a common axis;
(d) means including two pairs of input electrodes in contact with the first pair of tines for exciting said tines substantially at the resonant frequency thereof, said input electrodes being in the X-Y and Y-Z planes of said wafer;
(e) means including two pairs of output electrodes disposed in contact with the second pair of tines in the Y-Z plane for deriving an output signal representative of the angular rate experienced by said system, the flexural frequency of said first pair of tines being lower than that of said second pair of tines; and
(f) a plurality of bridges integral with said frame and connected to said stem.

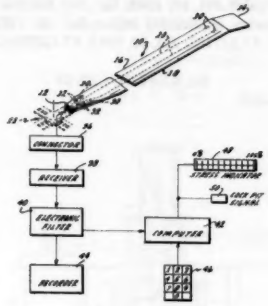
4,524,620

IN-FLIGHT MONITORING OF COMPOSITE STRUCTURAL COMPONENTS SUCH AS HELICOPTER ROTOR BLADES

Dale M. Wright, Folsom, Calif., and Robert L. Kiraly, Mesa, Ariz., assignors to Hughes Helicopters, Inc., Culver City, Calif.

Filed Feb. 7, 1983, Ser. No. 464,343
Int. Cl.³ G01N *29/04*; G01M *5/00*
U.S. Cl. 73—587 **4 Claims**

1. Apparatus for determining the actual useful life of interchangeable helicopter blades comprising:
means associated with a particular helicopter rotor blade for monitoring acoustic emissions emitted by said rotor blade under operating stress;
computer means associated with said helicopter for accumulating a count of monitored acoustic emissions indicative of progressive structural failure of said interchangeable helicopter rotor blade, said computer means including data storage means for storing said count of acoustic emissions, and input means for entering a base count indicative of acoustic emissions emitted by said rotor blade during use prior to installation in said particular helicopter; and



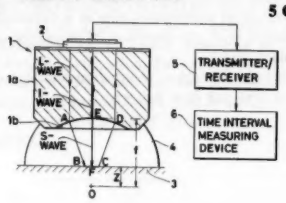
indicator means for warning the crew of said helicopter of a cumulative count and/or stress level approaching a predetermined acoustic emission count associated with catastrophic failure of similar rotor blades such that the actual useful life of said rotor blade may be exhausted prior to actual rotor blade failure.

4,524,621

METHOD FOR MEASUREMENT OF VELOCITY OF SURFACE ACOUSTIC WAVE

Kazushi Yamanaka, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,768
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 **5 Claims**



1. A method for the measurement of the velocity of the surface acoustic wave of a test piece, which comprises disposing an acoustic lens to have its focal point located within said test piece, projecting an acoustic wave in the form of pulses onto said test piece through said acoustic lens, measuring the interval separating the time at which a first component of the projected acoustic wave is returned in consequence of specular reflection on the surface of said test piece and the time at which a second component of the projected acoustic wave is returned after having been propagated in the form of a leaky surface acoustic wave along the surface of said test piece, measuring the interval separating said time of said first component and the time at which a third component of the projected acoustic wave is returned in consequence of internal reflection on the boundary of said acoustic lens, and calculating the velocity of the surface acoustic wave of said test piece based on the two time intervals obtained.

4,524,622

METHOD AND APPARATUS OF ULTRASONIC FLAW DETECTION

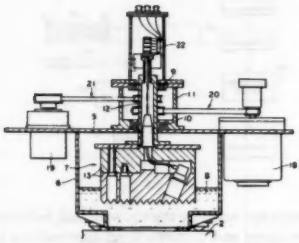
Norio Suzuki; Hiroshi Kajikawa, both of Kobe, and Tadashi Nishikawa, Osaka, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 18, 1983, Ser. No. 514,864

Claims priority, application Japan, Jul. 20, 1982, 57-127184; Jul. 20, 1982, 57-127183; Jul. 20, 1982, 57-127185; Jul. 20, 1982, 57-127186

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—620 **8 Claims**



6. A method of ultrasonic flaw detection suitable for detecting internal defects of a material, said method comprising the steps of:

providing a probe on a rotary body to transmit and receive ultrasonic pulses in a direction intersecting the axis of rotation of said rotary body in an inspecting zone of a material which is positioned opposite to said probe wherein a flaw, if one exists, in said material reflects said transmitted pulses from said probe to provide said received pulses back to said probe;

turning said rotary body to revolve said probe through 360° about said axis of rotation while transmitting and receiving said ultrasonic pulses;

indicating on a display medium the peak values of echoes received at a detection gate as a detected flaw pattern in relation with the direction of incidence of said ultrasonic pulses; and

judging the direction, inclination and size of a defect from said detected flaw pattern.

4,524,623

TRANSDUCER DRIVE ASSEMBLY

Richard A. Terwilliger, Los Gatos, Calif., assignor to Diasonics, Inc., Milpitas, Calif.

Filed Feb. 27, 1984, Ser. No. 583,990

Int. Cl.³ G01N *29/00*

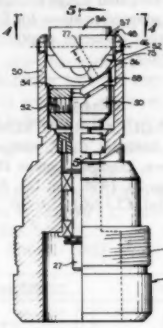
U.S. Cl. 73—633 **12 Claims**

1. An improved drive assembly for oscillating an article, comprising:

a frame;

a cradle for carrying said article pivotally fastened to said frame at pivot points, said cradle including a lower base section formed generally in the shape of a segment of a cylinder;

a rotor including a body and an upwardly extending contact plate, said contact plate extending upward from said body at a predetermined angle, such that at least some portion of said contact plate is maintained in physical contact with at least some portion of said lower base section at all times;



drive means coupled to said rotor for rotating said rotor about its longitudinal axis, the rotation of said rotor forcing said cradle to oscillate about said pivot points;

whereby said article is oscillated about said pivot points.

4,524,624

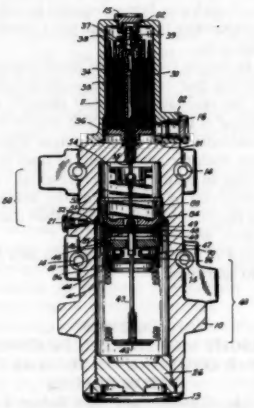
PRESSURE AND DIFFERENTIAL PRESSURE DETECTORS AND TRANSMITTER FOR USE IN HOSTILE ENVIRONMENT

Emanuel J. Di Noia, Greenwich, and Theodore R. Breunich, Stamford, both of Conn., assignors to Peerless Nuclear Corporation, Stamford, Conn.

Filed Oct. 25, 1982, Ser. No. 436,274

Int. Cl.³ G01L *9/10, 19/04*

U.S. Cl. 73—708 **11 Claims**



1. A pressure detector for sensing the pressure of a fluid system, and suitable for use in a hostile environment in which the environmental temperature and pressure can vary up to 500° F. and 500 psig, comprising a housing formed of material suitable for withstanding conditions of said hostile environment; pressure transducer means disposed within said housing for converting said pressure into a corresponding longitudinal displacement; at least one port in said housing permitting fluid communication with said pressure transducer means; a differential transformer disposed within said housing and having a primary winding, an A secondary winding, a B secondary winding, and a movable core arranted to move with the me-

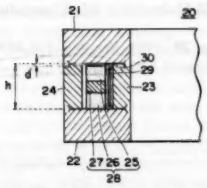
chanical displacement of said pressure transducer means; signal supply means disposed remote from said housing to supply an AC signal to the primary winding of said differential transformer; and a signal detecting and conditioning circuit disposed remote from said housing and including demodulating means coupled to said A and B secondary windings to produce an X demodulated signal and a Y demodulated signal respectively therefrom, adding means producing a sum signal from said X and Y demodulated signals as a temperature signal, subtracting means producing a difference signal from said X and Y demodulated signals as a pressure signal, and multiplying means producing a temperature-compensated differential pressure signal based on said temperature signal and said pressure signal.

4,524,625

PRESSURE SENSOR

Kiyoshi Takeuchi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 24, 1984, Ser. No. 574,693
Claims priority, application Japan, Jan. 31, 1983, 58-14380
Int. Cl.³ F16B *31/02*
U.S. Cl. 73—754 **11 Claims**



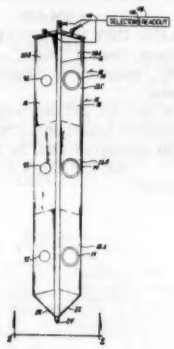
6. A pressure sensor comprising:
(a) concentrically spaced inner and outer rings having equal axial dimensions;
(b) axially spaced first and second discs extending coaxially with respect to the rings and each having a central bore, the discs sandwiching the rings and defining an annular inside space in conjunction with the rings;
(c) a first annular piezoelectric element coaxially disposed within the inside space and having first and second opposite faces, the first face of the first piezoelectric element contacting a face of the first disc defining the inside space;
(d) an annular electrode coaxially disposed within the inside space and having first and second opposite faces, the first face of the electrode contacting the second face of the first piezoelectric element; and
(e) a second annular piezoelectric element coaxially disposed within the inside space and having first and second opposite faces, the first face of the second piezoelectric element contacting the second face of the electrode, the second face of the second piezoelectric element being separated from a face of the second disc defining the inside space by a predetermined clearance so that the second face of the second piezoelectric element comes into contact with the face of the second disc only when the external force exerted between the discs exceeds a predetermined level.

4,524,626

SOIL EFFECTIVE STRESS SENSOR AND METHOD OF USING SAME

Mark W. Pabst, and Richard L. Handy, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 11, 1983, Ser. No. 540,652
Int. Cl.³ G01B *7/16*
U.S. Cl. 73—784 **18 Claims**



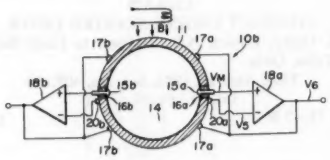
1. A device for determining the effective stress of saturated soil, comprising:
a flat frame having front and back surface, and
a sensor means mounted on said frame for directly measuring the effective stress of the soil when said frame is placed in the ground, said sensor means including a single flexible diaphragm having an outer surface flush with one of the surfaces of said frame, a strain gauge bonded to the inner surface of said diaphragm, a filter spaced apart from said diaphragm, and a bore in said frame providing communication between said diaphragm and said filter.

4,524,627

ELECTROMAGNETIC FLOW METER

Hiro Yamasaki, Tokyo; Tung Jin Chin, Yokohama, and Chuji Akiyama, Kawasaki, all of Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,799
Claims priority, application Japan, Jul. 3, 1982, 57-115870
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.12 **9 Claims**



1. An electromagnetic flow meter comprising:
(a) a conductive conduit through which a fluid flows;
(b) means for applying a magnetic field to said conduit to induce an electromotive force in said fluid;
(c) signal detecting means for detecting the electromotive force induced in said fluid to produce a first detecting signal;
(d) means disposed in the vicinity of said signal detecting means for detecting a voltage of said conduit to produce a second detecting signal;
(e) electrical energy applying means responsive to said first

and second detecting signals for applying a selected amount of voltage to said conduit so that the voltage of said first detecting signal and the said detected voltage of said conduit become equal to each other, whereby a profile of the voltage of said conduit is substantially similar to a profile of said electromotive force at least at a position of said signal detecting means.

4,524,628

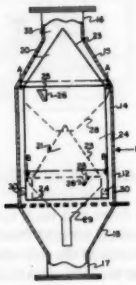
IN LINE DRY MATERIAL SAMPLER

Lynn A. Knudtson, Omaha, Nebr., and Glenn R. Sprenger, Lakeland, Fla., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 291,680, Aug. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 119,267, Feb. 7, 1980, abandoned. This application Oct. 29, 1984, Ser. No. 665,814

Int. Cl.³ G01N *1/20*

U.S. Cl. 73—863.43 **7 Claims**



1. A sampling device for obtaining a representative sample of freely flowing material comprised of a series of concentrically nested stages in a housing; each stage of the concentrically nested stages being comprised of a cylinder with a cone attached at one end to form the top of the stage, the cylinder having a plurality of openings, and a plurality of angled chutes positioned to direct material passing over the cone into the openings, the chutes being arranged around the circumference of the cylinder, each stage except one having a stemless funnel containing an outlet for conveying the material entering the stage to the conical surface of the next stage, which projects into the outlet of the stemless funnel, the excepted stage having means for conveying the sample out of the sampling zone.

4,524,629

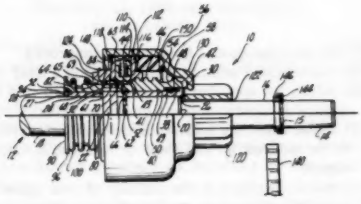
COMPACT ENGINE STARTER DRIVE

James J. Digby, Elmira, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Aug. 18, 1982, Ser. No. 409,196

Int. Cl.³ F02N *15/06*

U.S. Cl. 74—7 R **12 Claims**



1. An engine starter device for starting an internal combustion engine, said internal combustion engine having starter means and a ring gear, said starter means including a power shaft, said device comprising:

a pinion gear slidably mounted on said power shaft for axial movement relative to said power shaft, said pinion gear further moving into and out of engagement with said ring gear of said internal combustion engine;

an outer sleeve member mounted on said power shaft, said outer sleeve member having external helical splines;

means interposed said outer sleeve member and said power shaft, for transmitting torque between said power shaft and said outer sleeve member in one direction of relative rotation;

an intermediate sleeve member non-rotatably mounted on said power shaft, said intermediate sleeve member having a first portion for slidably and rotatably mounting said outer sleeve member and a second portion for slidably mounting said means for transmitting torque;

a control nut member threadably mounted on said external helical splines of said outer sleeve member;

an enclosing cup member interposed said control nut member and said pinion gear, said enclosing cup member having a closed end connected to said pinion gear for rotation therewith, and an open end opposite said closed end and defining a cavity between said open end and said closed end; and

means for translating torque from said control nut member to said pinion gear, said means for translating torque being disposed in said cavity of said enclosing cup member between said control nut member and said pinion gear.

4,524,630

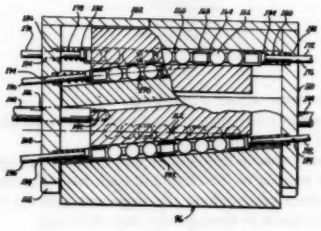
MECHANICAL FORCE AMPLIFIER

Leo A. Toth, 17030 Joshua Tree Ct., Sun City, Ariz. 85373, and David M. Toth, 1955 Hulmeiville Rd., Cornwells Heights, Pa. 19020

Filed Sep. 29, 1983, Ser. No. 536,859

Int. Cl.³ F16H *25/18*

U.S. Cl. 74—110 **48 Claims**



1. A mechanical force amplifying device, said device comprising in combination:

(a) a housing, said housing including a base, at least one sidewall and a bearing surface formed in said housing;

(b) a slide block disposed within said housing and moveable in response to an input force, said slide block including a first bearing surface and a second bearing surface, said second bearing surface being inclined with respect to said first bearing surface;

(c) a longitudinally moveable ram laterally retained by at least said one sidewall for providing an output force, said ram including a bearing surface parallel with said second slide block bearing surface and a surface for imparting the output force;

(d) first roller bearing means disposed intermediate said housing bearing surface and said first slide block bearing surface and second roller bearing means disposed interme-

diate said second slide block bearing surface and said ram bearing surface; and

(e) first means for biasing said first roller bearing means to the center of said housing bearing surface and second means for biasing said second roller bearing means to the center of said ram bearing surface;

whereby, the output force is an amplification of the input force in a ratio inversely proportional to the sine of the angle between said first slide block bearing surface and said second slide block bearing surface.

4,524,631

VALVE FOR POWER-STEERING SYSTEMS

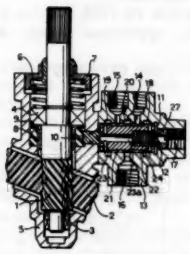
Ettore Cordiano, Turin, Italy, assignor to Corint S.r.L., Turin, Italy

Filed Nov. 2, 1982, Ser. No. 438,423

Claims priority, application Italy, Nov. 9, 1981, 68449 A/81

Int. Cl.³ F16H *35/00*; F16K *31/44*; B62D *5/06*; F15B *9/10*

U.S. Cl. 74—388 PS **3 Claims**



1. A valve for controlling a power assisted rack and pinion steering system comprising housing means, helical pinion means having a longitudinal axis mounted for limited axial movement along said axis in said housing means, prestressed rubber means operatively coupled to said helical pinion means for compression and expansion in the axial direction upon axial movement of said helical pinion means, control valve means having a slide member disposed therein for controlling the flow of fluid to said power assisted steering means and sensor means operatively coupled to said slide member and disposed in engagement with said rubber means for movement along an axis substantially perpendicular to the axis of said helical pinion means whereby every axial movement of said helical pinion means will result in a specific movement of said sensor means given by the movement of the pinion multiplied by the ratio between the area of the rubber means exposed to the axial thrust exerted by said helical pinion means and the area of said sensor means in contact with said rubber means and projected along its axis of motion.

4,524,632

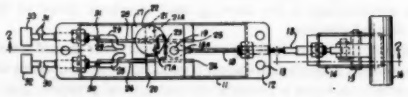
SELECTING MECHANISM

Louis F. Ballard, Medina, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Mar. 29, 1984, Ser. No. 594,844

Int. Cl.³ G05G *9/00*

U.S. Cl. 74—471 R **10 Claims**



9. Selecting mechanism for selectively connecting actuating means to one of a plurality of devices to be actuated as desired, comprising the combination of a block member adapted to be moved along a first path by the actuating means, a bar member movable relative to said block member in a second path athwart said first path, to a plurality of alternate positions, and a plurality of engaging members each connected to one of said devices, and means for manually moving said bar member in said second path between said alternate positions to selectively operatively engage the block member and one of said devices.

4,524,633

SUPPORTING STRUCTURE FOR A FLOOR-MOUNTED TYPE SPEED CHANGE LEVER

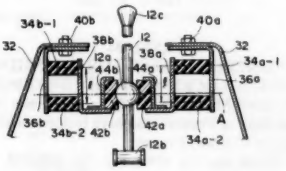
Masanori Murata, and Isao Hayashi, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 11, 1982, Ser. No. 377,191

Claims priority, application Japan, May 13, 1981, 56-71993

Int. Cl.³ G05G *9/16, 7/16*

U.S. Cl. 74—473 R **4 Claims**



1. A supporting structure for a floor-mounted type speed change lever of a motor vehicle, comprising two identically constructed supporting units which are mounted to the vehicle floor and oriented abreast facing toward the front of said vehicle, the two supporting units being arranged to receive therebetween an enlarged spherical portion formed on said lever so that said lever is pivotal at said spherical portion relative to said supporting units, wherein each of said units comprises at least two parallel elastic blocks which are spaced from each other in a direction in which said lever extends.

4,524,634

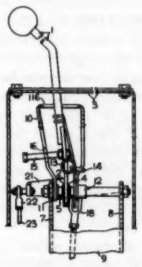
TRANSMISSION SHIFTING MECHANISM

Robert C. Haupt, West Allis, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Feb. 9, 1983, Ser. No. 465,157

Int. Cl.³ G05G *9/16*

U.S. Cl. 74—473 R **3 Claims**



1. A shift mechanism for shifting a vehicle transmission comprising a control console, a shift selector lever mounted on said control console for pivotal movement on a transverse axis and a fore and aft axis, an inverted U-shaped shifting segment having a horizontal portion and a pair of downwardly extending legs with their lower ends pivotally mounted on said console on said transverse axis, means defining a transversely

extending slot in said horizontal portion through which said lever extends, said slot permitting relative movement between said selector lever and said shift selector lever about said fore and aft axis and preventing relative movement between said selector lever and said shifting segment about said transverse axis, means defining a vertically elongated slot in one of said legs of said shifting segment, a stabilizer finger rigidly secured to said selector lever and extending horizontally therefrom and through said vertically elongated slot, said slot and said stabilizer finger cooperating to prevent rotation of said lever about a vertical axis, a transmission including a plurality of shifting devices, a shift selector for selectively and alternatively engaging one of said shifting devices, a shift selector mechanism connected between said shift selector lever and said shift selector selectively engaging said shifting devices responsive to pivotal movement of said shift selector lever about said fore and aft axis, and a shifting mechanism connected between said shifting segment and said shift selector for selectively shifting said transmission responsive to pivotal movement of said shift selector lever and said shifting segment about said transverse axis.

4,524,635

MANUAL CONTROL DEVICE FOR CHANGING SPEEDS INCLUDING A LOCKING OF THE REVERSE SPEED

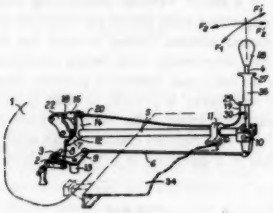
René Hulin, Rueil-Malmaison, and Daniel Schuler, St. Remy les Chevreuse, both of France, assignors to Automobiles Peugeot-/Automobiles Citroen, France

Filed Jan. 14, 1983, Ser. No. 458,146

Claims priority, application France, Jan. 20, 1982, 82 00809

Int. Cl.³ F16N *57/06*

U.S. Cl. 74—476 **7 Claims**



7. A manual control device in combination with a gear box having two movable elements and a body of an automobile vehicle, said device comprising a gear shift lever located relatively remote from the gear box and carried by a bearing mounted on the body of the vehicle, at least one articulated rod and a bell crank lever connecting the gear shift lever to said two movable elements, so that, by a given pivoting of the gear shift lever successively in two directions substantially perpendicular to each other, each speed ratio of the gear box is selected and then engaged, the device further comprising first abutment means and second abutment means which cooperate upon a pivoting of the gear shift lever toward a reverse speed position, and means for disengaging said two abutment means and comprising a lever pivotally mounted on the gear box and connected to the gear shift lever through said rod, the first abutment means being mounted on the gear box and the second abutment means being disposed on the lever which is pivotally mounted on the gear box,

wherein one of the abutment means is a retractable locking finger member and means comprising a transmission cable connect the finger member to the gear shift lever; a

further including a guide connected to the selecting lever and in which guide the locking finger member is slidable in a direction parallel to the pivot axis of the rod and is biased by a spring towards a position in which the locking finger member is capable of cooperating with the first abutment means which are in the form of an abutment connected to the gear box, and a sleeve axially slidable on the gear shift lever, the transmission cable having an end portion which is connected to the locking finger member and a sheath for the cable bearing against the guide, the cable having an opposite end portion connected to the sleeve which is axially slidable on the gear shift lever, and the gear shift lever carrying a lug against which the sheath of the cable bears.

4,524,636

SLOT MACHINE HANDLE LOCKING DEVICE

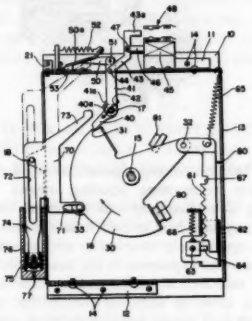
Ikuo Nishikawa, Tochigi, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Jul. 19, 1983, Ser. No. 515,353

Claims priority, application Japan, Jul. 26, 1982, 57-112185[U]

Int. Cl.³ G05G *5/06*

U.S. Cl. 74—527 **10 Claims**



1. In a slot machine handle locking device for locking a slot machine handle for determining the instant of start of rotation of a plurality of reels and also functioning to release the lock of the handle and permit operation thereof so as to cause rotation of the reels when a coin is inserted, an improvement comprising:

a locking member rotatable in unison with said handle and having an engagement section;

a locking pawl movable between an initial locked position in engagement with said engagement section and a position out of engagement therewith;

an interlock lever movable between a first and second position, said locking pawl being held in said locked position when said interlock lever is in said first position,

a spring for biasing said locking pawl toward said out-of-engagement position so that said locking pawl can move following said interlock lever;

an electromagnet for moving said interlock lever to said second position;

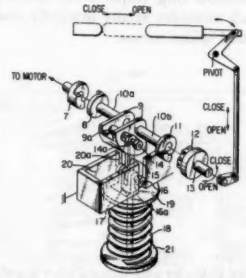
locking means for locking said interlock lever in said second position against restoration to said first position when said interlock lever is brought to said second position; and

releasing means for releasing said locking means from a locked state when said locking pawl is returned to said initial locked position in engagement with said locking pawl.

4,524,637
SPRING-OPERATED MECHANISM

Toshiaki Yoshizumi, Minoo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,715
Int. Cl.³ F16H *53/06, 25/18*
U.S. Cl. 74—569 4 Claims

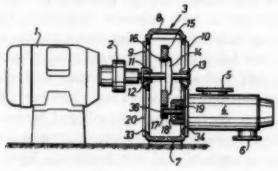


1. A spring-operated mechanism comprising:
a cam means secured to a crankshaft and adapted to be moved thereby,
cam grooves formed in said cam means having such a shape that the distance from a center of said crankshaft is smallest at a middle portion of said cam grooves and progressively increases towards extremities of said cam grooves,
a connecting rod provided with a guide roller at one end rolling within said cam grooves,
a spring rod provided at the other end of the connecting rod,
a bottom spring support connected to the spring rod at an end opposite from the connecting rod,
a stationary member provided with groove means at the other end of the connecting rod for guiding rectilinear movement of said connecting rod, and
a spring support means disposed between said stationary member and said bottom spring support,
whereby said spring means is adapted to accumulate energy when said crankshaft is rotated through a predetermined angle by a driving source, and, upon further revolution of said crankshaft, said spring means releases said energy to urge said crankshaft to rotate quickly.

4,524,638
GEAR BOX FOR A COMPRESSOR PLANT

Michel A. J. Van Hee, Kontich, Belgium, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 1, 1983, Ser. No. 499,852
Claims priority, application Sweden, Jun. 7, 1982, 8203504
Int. Cl.³ F16N *57/02*
U.S. Cl. 74—606 R 2 Claims

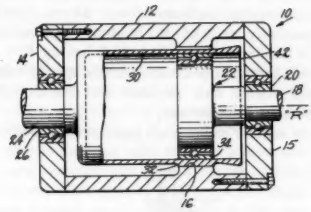


1. A gear box for a compressor plant comprising a pair of facially opposed sides (36, 37) defining a gear housing therebetween and providing journal means for a motor driven shaft (11) for rotating a driving gear wheel (15) in said gear housing, first mounting means (34) in one of said facially opposed sides, having an opening for accommodating a first compressor stage of predetermined size, said compressor stage having a shaft (38) rotatably supported in bearings means (18) in one of said facially opposed sides and carrying a driven gear wheel (17) meshing with said driving gear wheel (15) within said housing, said gear box being characterized by second mounting means (33) on the side opposite to said first mounting means and having an opening for alternatively accommodating a second compressor stage differing in size from said first compressor stage, each of said openings being of a size sufficient to facilitate access to said bearing means (18) and said driven gear wheel from the opposite one of said facially opposed sides, and a cover plate (20) covering said openings when not accommodating said compressor stages.

4,524,639
EXTENDED FLEXSPLINE ARRANGEMENT

John H. Carlson, Danvers, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 23, 1983, Ser. No. 507,014
Int. Cl.³ F16H *33/00*
U.S. Cl. 74—640 5 Claims



1. A strain wave gearing assembly for transmitting motion, comprising:
a housing;
a circular spline arranged within said housing, said circular spline having an annular array of gear teeth therearound;
a flexspline rotatably journaled within said housing, said flexspline being of cylindrical configuration and open at last at one end thereof, and having an array of gear teeth therearound, engageable with said gear teeth of said circular spline;
a wave generating means arranged with said rotatably flexspline so as to provide an advancement deflection wave in the annular array of gear teeth therearound; and
a shape control means comprising an enlarged distal periphery on the open end of said rotatable flexspline longitudinally outwardly of said annular gear teeth so as to minimize the distortion of the wave shape, thereby minimizing the operating deflection stress within said rotatable flexspline as said deflection wave progresses therearound.

4,524,640
INTEGRAL HOLDOUT RING AND SPRING RETAINER FOR DIFFERENTIALS

Lawrence T. Neumann, Troy, and Walter L. Dissett, Southfield, both of Mich., assignors to Tractech, Inc., Warren, Mich.

Filed Nov. 10, 1981, Ser. No. 319,961
Int. Cl.³ F16H *35/04*
U.S. Cl. 74—650 1 Claim

1. In a differential mechanism in cluding a pair of colinearly aligned output shafts (4,6) having spaced adjacent ends; an annular spider driving member (16) arranged in concentrically spaced relation about said output shaft adjacent ends; clutch means normally effecting a driving connection between said driving member and said output shafts, respectively, said clutch means including a pair of annular side gears (22, 24) non-rotatably mounted on the adjacent ends of said output shafts, respectively, a pair of annular driven clutch members

(18, 20) mounted on said side gears for axial displacement on opposite sides of said driving member, respectively, said clutch member having inner circumferential surfaces, and spring means (40, 42) biasing said driven clutch members axially inwardly toward clutch-engaging positions relative to said driving member, respectively; means including an annular center cam member (28) concentrically mounted within, and rotatably connected with, said driving member, said center cam member being operable when one of said output shafts overruns the other for disengaging from said driving member the driven clutch member associated with said overrunning shaft; and holdout ring means (34, 36) for maintaining said associated driven clutch member in the disengaged condition as long as said one output shaft overruns the other shaft;

the improvement wherein

(A) said holdout ring means comprises a pair of generally annular axially-split resilient holdout rings (34, 36) arranged on opposite sides of said center cam member and extending at their remote ends concentrically between said driven clutch members and said side gears, respectively, said holdout rings being resiliently biased radially outwardly into frictional engagement with said inner circumferential surfaces of said driven clutch members, respectively, each of said holdout rings including

(1) a tubular portion (34*d*, 36*d*) having first and second ends arranged in concentrically spaced relation within said central cam member and the associated clutch member, respectively;

(2) an annular radial body portion (34*b*, 36*b*) that extends radially outwardly from said second end of said tubular portion adjacent and in frictional engagement with the associated clutch member, said radial body portion terminating adjacent its outer periphery in a flange portion (34*a*, 36*a*) that extends within a corresponding groove contained in said inner circumferential surface of the associated clutch member, whereby said holdout rings are connected for frictionally resisted angular displacement relative to, but are retained against axial displacement with respect to, the associated driven clutch member, respectively;

(3) a plurality of circumferentially spaced integral holdout lugs (34*c*, 36*c*) extending axially from said radial body portion adjacent said center cam member, said holdout lugs extending axially with corresponding slots contained in the ends of said center cam member, respectively, said slots having in longitudinal cross-section a configuration defining holdout shoulders, said lugs being so dimensioned and having such a configuration that when one of the shafts is in an overruning condition, the associated holdout ring is slightly axially and angularly displaced relative to the central cam member from an inoperable central position relative to the associated slot to an operable holdout position on one of said shoulders in which the associated driven clutch member is maintained disengaged from said spider driving member; and

(4) a radially inwardly directed annular spring retainer flange (34*e*, 36*e*) carried by said first end of said tubular portion adjacent said center cam member;

(B) said spring means comprising a pair of compression springs (40, 42) mounted concentrically intermedicate said holdout rings and said side gears, respectively, each of said spring means reacting at opposite ends with the associated side gear and with the spring retainer flange on the associated holdout ring, respectively, thereby to bias said driven clutch members axially inwardly toward engagement with said spider means.

4,524,641

CONTINUOUSLY-VARIABLE RATIO-TRANSMISSION

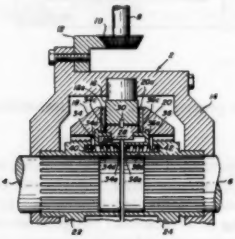
Christopher J. Greenwood, Preston, England, assignor to Leyland Vehicles Limited, Great Britain

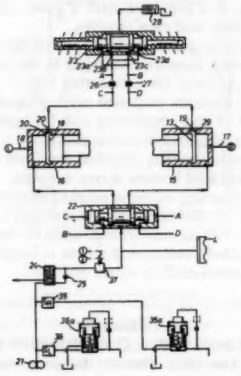
Filed Oct. 22, 1982, Ser. No. 436,052

Claims priority, application United Kingdom, Oct. 24, 1981, 8132125

Int. Cl.[3] **F16H** *15/08, 15/00, 37/06*

U.S. Cl. 74—691 **16 Claims**



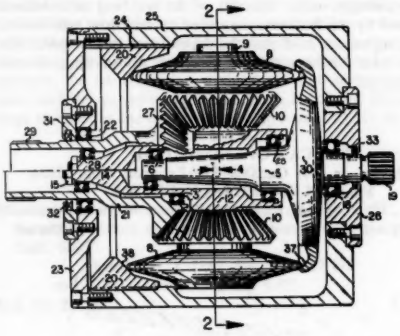


1. A continuously-variable ratio transmission of the rolling traction type having at least one pair of toroidally-recessed discs with rollers interposed on mountings therebetween, and having a hydraulic control circuit, said transmission comprising a pair of hydraulic rams for exerting forces on one of said roller mountings in two opposite directions to displace said rollers and to balance any roller reaction force; each of said hydraulic rams having a cylinder defining a working chamber and a head, said hydraulic control circuit including a hydraulic line passing through the working chamber of each of said hydraulic rams, there being two of said hydraulic lines, one hydraulic line for each of said hydraulic rams, means for varying pressure in each of said two hydraulic lines for producing said forces exerted on said one roller mounting; and each of said hydraulic rams having a hydraulic end stop arrangement operating when said one roller mounting approaches an end position to restrict the corresponding one of said hydraulic lines only, thereby to increase substantially the pressure within said one corresponding hydraulic line causing said forces strongly to resist further roller displacement towards said end position.

4,524,642
HIGH TORQUE INFINITELY VARIABLE EPICYCLIC TRANSMISSION

Joseph E. Fritsch, 14001 Sherwood, Oak Park, Mich. 48237

Filed Jan. 17, 1983, Ser. No. 446,589
Int. Cl.³ F16H 15/50
U.S. Cl. 74—796 29 Claims



14. A high torque infinitely variable epicyclic transmission comprising:

a housing;

input and output shafts having end portions extending into said housing and rotating about a first axis of rotation;

a rotor rotatable with said input shaft about said first axis of rotation;

a traction ring coaxial with said first axis of rotation in spaced relation with said rotor;

said traction ring axially shiftable within said housing having means preventing rotary motion;

said rotor and said traction ring having inwardly facing traction surfaces;

outer diameter of said rotor traction surface being inclined inwardly and forming a generally dished cross sectional shape;

outer diameter of said traction ring traction surface being inclined inwardly and forming a generally dished cross sectional shape;

said dished cross sectional shape of said rotor means and said traction ring means effecting a continuously increasing amount of torque to be transmitted from said input shaft to said output shaft as the input/output ratio between the said shafts increases

a spider rotatable about said first axis of rotation having a plurality of spindles radiating outwardly;

a plurality of cylinders rotatably supported by said plurality of spindles;

a plurality of discs rotatably and slidably carried by said plurality of cylinders, each said disc in driving relationship with each of the said cylinders through a torque dependent traction loading means;

each said disc having a traction surface portion engaged in driven relationship with said inwardly facing traction surfaces of said rotor and said traction ring;

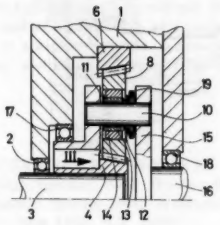
a plurality of gears in driven relationship with said plurality of cylinders;

gearing rotatable with said output shaft and in driven relationship with said plurality of gears.

4,524,643
EPICYCLIC GEAR

Rolf Ziegler, Nusslock, and Peter Hauk, Bonndorf, both of Fed. Rep. of Germany, assignors to Mavilor Systemes S.A., Switzerland

Filed Jan. 4, 1983, Ser. No. 455,498
Claims priority, application Switzerland, Jan. 18, 1982, 271/82
Int. Cl.³ F16H 1/28, 55/18
U.S. Cl. 74—801 4 Claims



1. An epicyclic gear comprising a sun pinion axially fixed to a first shaft rotatably mounted through bearings in a gear housing, a hollow wheel having internal teeth concentric with said sun pinion and being fixed to the gear housing, and at least two planet wheels meshing with said sun pinion and said hollow wheel, and interconnected by a planet carrier rotatably fixed to a second shaft coaxial with said first shaft, wherein spur teeth are located on all of the wheels and are provided with a profile correction changing continuously along a width portion of each tooth and in each couple of meshing wheels this correction changes in opposite directions along the tooth width, the planet wheels being on the one hand movable separately and independently of one another in an axial direction and biased in said axial direction by a spring means exerting a resilient axial force and disposed between said wheels and the planet carrier, and on the other hand allowed to move radially on a planet-wheel stub shaft associated with each planet wheel, which connects the planet wheel to the planet carrier, by being oscillatably mounted on pendulum bearings, which allow radial movement, yet maintain the axis immovably fixed to the planet carrier and parallel to the other axes, all the wheels comprising crowned teeth, the sun pinion and the planet carrier being axially fixed to their shafts, the planet carrier being non-tiltable.

4,524,644
COUNTERWEIGHT FOR ORBITAL DRIVE MECHANISM

Michel A. Pierrat, 48 Farrwod Dr., Andover, Mass. 01810

Filed Apr. 19, 1983, Ser. No. 486,329
Int. Cl.³ F16H 1/28
U.S. Cl. 74—804 6 Claims

1. In a speed reducing mechanism comprising

an orbital rotor assembly having a perimeter defined by an epitrochoid curve,

a set of rollers positioned in a circle and arranged respectively to operatively engage said perimeter of said rotor assembly,

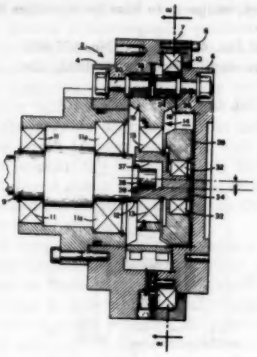
a drive shaft, and

a first eccentric means connected to said drive shaft and arranged to drive said rotor assembly in an orbital path,

a counter balance mechanism including

a second eccentric means including a countershaft con-

nected to said drive shaft and offset 180 degrees from said first eccentric means, and



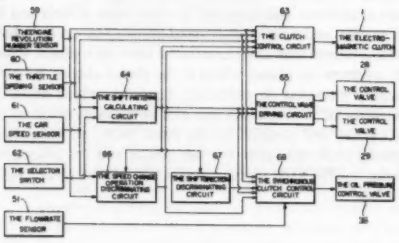
a counterweight rotatably mounted on said countershaft and having its mass symmetrically distributed about the axis of said countershaft.

4,524,645

SPEED CHANGE CONTROL UNIT OF AUTOMATIC TRANSMISSION FOR AUTOMOBILES UTILIZING FLUID FLOW RATE

Takumi Tatsumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,530
Claims priority, application Japan, Jan. 14, 1982, 57-5615
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—866 **3 Claims**



1. An automatic transmission apparatus for an automobile, comprising:

a. means, including a plurality of hydraulic servo devices, for changing the gear ratios of the automobile, operable with pressurized working oil; said changing means including a hydraulic line for carrying the working oil to said hydraulic servo devices, and means for maintaining the working oil in the hydraulic line at a fixed oil pressure; the speed of the gear changes being a function of the pressure applied to the working oil by the servo devices, and the viscosity of the working oil; and

b. means for electrically controlling the speed of gear changes by said hydraulic servo devices as a function of the driving state of the automobile, so as to moderate gear shift shocks, said speed controlling means including:

(1) means for measuring the flow rate of the working oil at the constant oil pressure; said flow rate measuring means including a fixed orifice communicating with said hydraulic line, and means for measuring the flow rate of the working oil through said fixed orifice as an indication of the viscosity of the working oil;

(2) means for measuring the driving state of the automobile; and

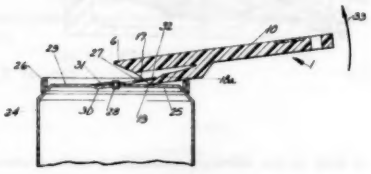
(3) means, responsive to the measurement of the driving state by said driving state measuring means and to the measurements of flow rate by said flow rate measuring means, for electrically controlling the application of pressure to the working oil by one of said hydraulic servo devices during changes of the gears; said pressure controlling means including means for compensating for changes in the viscosity of the working oil as indicated by the flow rate measured by said flow rate measuring means, such that the dependence of the speed of the gear changes on the viscosity of working oil is reduced.

4,524,646

TAB CAN OPENING TOOL

Fred Kimberlin, Jr., 341 Gallaher Rd., Lebanon, Ohio 45036

Filed Jun. 2, 1983, Ser. No. 463,598
Int. Cl.³ B67B *7/40*
U.S. Cl. 81—3.55 **19 Claims**



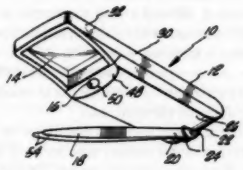
1. A hand-held tool for opening beverage cans and the like of the type having an end including a circumferentially extending upstanding rim and a weakened score line defining a generally U-shaped portion configured to be broken from the can end and forced by downward pressure into the interior of the can and a tab hingedly attached to the central portion of the can end including a nose portion overlying a portion of the U-shaped portion such that when the terminal end of the tab is lifted away from the can end, the nose is forced downwardly to bend the U-shaped portion into the interior of the can, said tool comprising a thin narrow elongated body terminating at one end in a graspable handle portion and at the opposite end in an opening dimensioned to be slipped over the can end tab and retain the tab when the tool is pivoted upwardly away from the can end, the lower margin of said opening forming a transversely extending sharp thin edge configured to easily slip between the tab and upper surface of the can end to initially lift the tab away from the can end, and a nose portion extending forwardly from and overlying said opening, said tool nose portion being configured to and extending forward a distance so as to press downwardly on the U-shaped portion of the can end when the tool is slipped over the can tab and pivoted upwardly to force the U-shaped portion into the interior of the can, said tool nose portion and said edge being positioned with respect to each other such that said tool nose portion remains out of contact with said can end when said edge is intially inserted between the tab and can end surface in order to insure that the edge can be initially slipped beneath the tab regardless of the spacing between the outermost end of the tab and the can rim, the underside of said tool nose portion including a nose surface sloping downwardly and rearwardly; a fulcrum portion depending downwardly from said body commencing at the rearmost edge of said surface, the lower surface of said fulcrum portion being configured to abut the upper surface of the can end, the forward end of said fulcrum portion including said opening, the floor of said opening including a first surface sloping upwardly and rearwardly away from the forward edge

of said lower surface and a surface spaced from said lower surface continuing rearwardly from the rear edge of said first surface, the intersection of said first and lower surfaces forming said edge, said nose surface being configured to insure access to and guide the tab into said opening irrespective of the spacing between the outermost edge of the tab and the can end rim, said second surface continuing upwardly and rearwardly at a lesser slope from the rearmost edge of said first surface, the space between said first and second surfaces and a roof surface forming an opening of decreasing height such that a portion at least of the spacing between said nose and second surfaces is less than the thickness of the tab, said edge operating to initially lift the tab away from the can end when the tab is inserted into said opening, said first surface operating to further lift the tab and guide it into the space between said second and nose surfaces, the tab becoming wedged between said second and nose surfaces to prevent the tab from becoming disengaged from the tool as the tool is rotated upwardly to lift the tab.

4,524,647
TWEEZER ASSEMBLY

Manning Holoff, deceased, late of Los Angeles, Calif., and by Geraldine Holoff, executrix, 2340 Donella Cir., Los Angeles, Calif. 90077

Filed Oct. 1, 1982, Ser. No. 432,190
Int. Cl.³ B25B 9/02
U.S. Cl. 294;99.2 **2 Claims**

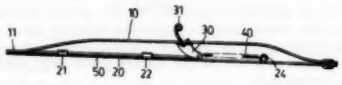


1. A tweezer assembly comprising a body portion, a magnifying lens carried by said body portion adjacent one end thereof and defining a given focal range, a light source carried by said body portion and positioned such that the path of illumination eminating therefrom passes through said focal range, means for activating said light source, and a pair of tweezers, one end of said tweezers being pivotally mounted on said body portion such that the other extended gripping ends of said tweezers are moveable between a storage position adjacent said body portion and an operative position within the focal range of said lens and the path of illumination of said light source wherein the ends of said tweezers are concurrently magnified and illuminated to facilitate visibility thereof.

4,524,648
FIXATION TWEEZERS

Charng J. Chung, No. 199, Kuang-Ming St., Yuan-Lin Chen, Changhua, Taiwan

Filed Aug. 17, 1984, Ser. No. 641,827
Int. Cl.³ B25B 9/02
U.S. Cl. 294—99.2 **3 Claims**

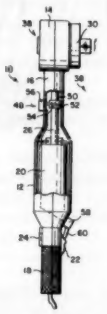


1. A fixation tweezers comprising:
a fixed handle having a first front end defining a first grasping jaw with straight working surface and a first rear end;
a movable handle including a second front end defining a second grasping jaw having working surface parallel with that of said first grasping jaw and a second rear end fixed with said first rear end;
a spring member having a first end and a second end secured on said fixed handle;
a controlling member disposed between said movable handle and said fixed handle, with one end thereof pivotably mounted to said movable handle and the other end connected with said first end of said spring member, being made with a configuration capable of being rotated pivotably against the biassing of said spring to achieve an open position, where said first and second grasping jaws being spaced apart and permitting a workpiece to be gripped therebetween, and when releasing, said controlling member returning to a closed position, where said first and second grasping jaws clamping against the workpiece.

4,524,649
ELECTRIC SOCKET WRENCH

Joe Diaz, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 19, 1983, Ser. No. 459,365
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.13 **3 Claims**



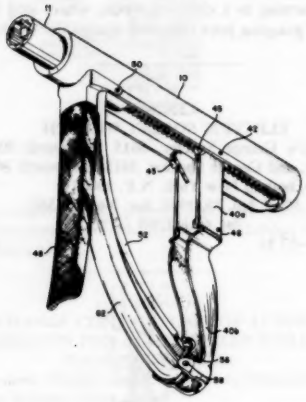
1. An electric socket wrench which comprises:
(A) a housing having a tubular head and a tubular neck;
(B) power means provided in the housing;
(C) A power driven shaft extending from the power means through the tubular neck into the tubular head;
(D) Transmission means for rotating a plurality of driving shafts mounted within the tubular head on said power driven shaft, whereby said driving shafts extend from said housing at right angles to each other in combination with additional means mounted on said housing coacting with the first said means to lock the said shafts from rotation, wherein the transmission means comprises:
(A) A first bevel gear affixed to the power driven shaft within the head;
(B) A second bevel gear rotatably mounted on one side of said head that meshes with said first bevel gear;
(C) One of said driving shafts affixed to the second bevel gear and connected to a socket driving member, wherein said additional means comprises:
(A) A free rolling third bevel gear mounted on the power driven shaft spaced inwardly of said first bevel gear meshing with said second gear so that the third bevel gear will rotate in an opposite direction of the first bevel gear;
(B) A turn knob threadably mounted on said head having a fourth bevel gear connected to the turn knob that meshes and locks with both said first bevel gear and said free rolling third bevel gear.

4,524,650

SQUEEZE-RATCHET TOOL ASSEMBLY

Joel S. Marks, 10508 Wilkins Ave., Los Angeles, Calif. 90024

Filed May 18, 1983, Ser. No. 495,673
Int. Cl.[3] B25B *13/46*
U.S. Cl. 81—57.39 9 Claims



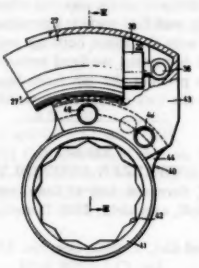
1. A two-part tool system comprising: a squeeze wrench section and a ratchet wrench section; said ratchet wrench section including: an elongated tubular housing having an open rear end, a drive head rotatably mounted on the forward end of the housing, a drive shaft for the drive head extending coaxially within the housing and having its rear end exposed through the open rear end of the housing; said squeeze wrench section including: an elongated housing, a grip handle attached to the housing and extending outwardly from the housing, a squeeze handle having one end pivotally attached to the housing and extending outwardly from the housing in essentially spaced and parallel relationship with the grip handle, a further drive shaft having at least one helical channel rotatably mounted in the housing and extending coaxially along the housing and having its forward end exposed through the end of the housing, a coupling mechanism intercoupling the squeeze handle to the further drive shaft so that pivotal movement of the squeeze handle produces rotational motion of the further drive shaft, said coupling mechanism including a slider which engages the helical channel on the further drive shaft and which is moved along the drive shaft upon pivotal movement of the squeeze handle to impart rotational motion to the drive shaft on a variable torque basis so that maximum torque is generated at the beginning of each squeeze stroke and maximum speed is generated at the end of each squeeze stroke of the squeeze handle, and coupling means for intercoupling the front end of the squeeze section housing to the rear end of the ratchet section housing and for intercoupling the further drive shaft of the squeeze section to the drive shaft of the ratchet section.

4,524,651

POWER WRENCH

Oswald Dubiel; Karl-Richard Hirtsiefer, both of Neunkirchen, and Paul-Heinz Wagner, Birrenbachshöhe, D-5203 Much, all of Fed. Rep. of Germany, assignors to Paul-Heinz Wagner, Much-Birrenbachshöhe, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,880
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113481; Apr. 3, 1981, 3113482
Int. Cl.[3] B25B *13/46*
U.S. Cl. 81—57.39 16 Claims



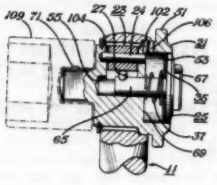
1. A power wrench comprising:
a wrench head casing having a ring to receive a button die;
a support element carried within the wrench head casing for abutment against a stationary support;
a piston-cylinder unit coupled between the wrench head casing and the support element for moving the wrench head casing relative to the support element; and
a guideway for the support element contained in said wrench head casing, said piston-cylinder unit located in said guideway and said support element being displaceable in the guideway and freely protruding from one end of the guideway.

4,524,652

RATCHET WRENCH OF THE SOCKET DRIVE TYPE WITH SOCKET EJECTOR

Kenneth G. Wenzel, Highland Village, and Jerry R. Duke, Redoak, both of Tex., assignors to Thorsen Tool Company, Dallas, Tex.

Continuation of Ser. No. 551,425, Nov. 14, 1983, abandoned. This application May 9, 1984, Ser. No. 608,470
Int. Cl.[3] B25B *13/46*
U.S. Cl. 81—63 2 Claims



1. A ratchet wrench of the socket drive type with socket ejector comprising:
a. a handle having a lever portion and a head portion, with the head portion having a central bore with internal spline-like teeth formed therein and oppositely disposed side faces;
b. a ratchet plug assembly installed in the head portion of said handle and including:
i. a ratchet plug with a body portion having a drive stud

end surface and having an integral socket drive stud protruding axially outwards from said drive stud end surface, an axial cylindrical recess having a bottom surface and opening to the body portion end opposite said socket drive stud, and a pair of spaced parallel ejector pin bores extending through said body portion and adjacent to respective side margins of said socket drive stud and opening to said axial cylindrical recess and a control knob bore coaxial with said axial cylindrical recess and extending from said axial cylindrical recess bottom surface in the direction toward said socket drive stud and having a bottom surface that is disposed axially inward with respect to said drive stud end surface;

ii. ratchet pawl means for driving or ratcheting on said spline-like teeth and reversing means therefor;

iii. a control knob for controlling both ratchet drive direction selection and socket ejection disposed in said axial cylindrical recess for reciprocable movement therein, with said control knob having a head portion which has an inner face and a cylindrical stub shaft portion having a constant diameter extending axially inward from said inner face with the diameter of said head portion being slightly less than the diameter of said axial cylindrical recess;

iv. an ejector pin retainer plate disposed on said stub shaft adjacent said inner face and having oppositely disposed side slots;

v. a pair of ejector pins each having an annular groove adjacent one end thereof with a respective annular groove being disposed within a respective said retainer plate side slot with said ejector pins being inserted in said ejector pin bores; and,

vi. a conical type control knob return spring having a larger diameter that is smaller than the transverse extent of said retainer plate and having a smaller diameter that is slightly larger than the diameter of said control knob stub shaft portion, with said control knob return spring being disposed between said cylindrical recess bottom surface and said ejector pin retainer plate, with the larger end of said spring facing said inner face of said control knob head portion, and;

vii. a ratchet reversing pin and a ratchet reversing pin bias spring, with said control knob stub shaft portion having a transverse recess disposed near said inward end for receiving said ratchet reversing pin and bias spring, such that said ratchet reversing pin may project from said recess to retain a sub-assembly comprising said retainer plate, ejector pins and control knob return spring when said wrench is being assembled.

4,524,653

RATCHET WRENCH OF THE SOCKET DRIVE TYPE WITH SOCKET EJECTOR

James W. Konecny, Fort Worth, Tex., assignor to Thorsen Tool Company, Dallas, Tex.

Continuation of Ser. No. 566,274, Dec. 28, 1983, abandoned. This application Jun. 12, 1984, Ser. No. 619,816

Int. Cl.³ B25B *13/46*

U.S. Cl. 81—63 **1 Claim**

1. A ratchet wrench of the socket drive type with socket ejector comprising:

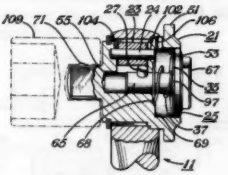
a. a handle having a lever portion and a head portion, with the head portion having a central bore with internal spline-like teeth formed therein and oppositely disposed side faces;

b. a ratchet plug assembly installed in the head portion of said handle and including:

i. a ratchet plug having a body portion having a drive stud end surface and having an integral socket drive stud protruding axially outwards from said drive stud end surface, an axial cylindrical recess having a bottom surface and opening to the body portion end opposite said socket drive stud, and a pair of spaced parallel ejector pin bores extending through said body portion and adjacent to respective side margins of said socket drive stud and opening to said axial cylindrical recess and a control knob bore coaxial with said axial cylindrical recess and extending from said axial cylindrical recess bottom surface in the direction toward said socket drive stud and having a bottom surface that is disposed axially inward with respect to said drive stud end surface;

ii. ratchet pawl means for driving or ratcheting on said spline-like teeth and reversing means therefor;

iii. a control knob for controlling both ratchet drive direction selection and socket ejection disposed in said axial



cylindrical recess for reciprocable movement therein, with said control knob having a head portion which has an inner face and a stub shaft portion extending axially inward from said inner face with the diameter of said head portion being slightly less than the diameter of said axial cylindrical recess;

iv. an ejector pin retainer plate disposed on said stub shaft adjacent said inner face and having oppositely disposed side slots;

v. a pair of ejector pins disposed within said retainer plate side slots and inserted in said ejector pin bores; and,

vi. a conical type control knob return spring disposed between said cylindrical recess bottom surface and said ejector pin retainer plate.

4,524,654

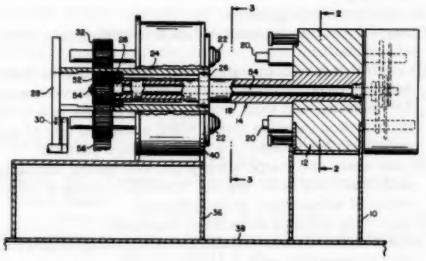
MULTI-SPINDLE AUTOMATIC SCREW MACHINE

Leslie G. Lucey, 400 Rawlinson Rd., Rochester, N.Y. 14617

Filed Jul. 19, 1982, Ser. No. 399,446

Int. Cl.³ B23B *3/34;* **B23P** *23/00;* **B23G** *1/08, 1/20*

U.S. Cl. 82—3 **3 Claims**



2. A multi-spindle automatic screw machine comprising a base support structure, an elongated shaft mounted by one of its end portions upon said base support structure and extending cantilever fashion horizontally therefrom, a plurality of tool holders, means mounting said tool holders in a fixed circular array coaxially around said shaft at the proximal end thereof, a plurality of work spindles equal in number to said tool holders, and journal means mounting said work spindles in circular array coaxially around said shaft at the distal end thereof for

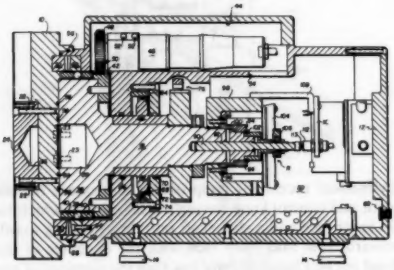
rotation upon the shaft, said shaft constituting the principal direct support for the work spindles, each of said work spindles being coaxially aligned and in end-to-end confrontation with a separate one of the tool holders in each operative position of the circular array of the work spindles.

4,524,655

INDEXABLE MACHINE TOOL TURRET AND ATTACHMENTS THEREFOR

Joseph P. Waldron, Horseheads, and Ivan R. Brown, Breesport, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,612
Int. Cl.³ B23B *29/32*
U.S. Cl. 82—36 A **20 Claims**



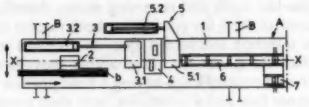
1. An indexable machine tool turret, comprising:
(a) a body having a chamber with an open end, a closed end and a central longitudinal axis;
(b) an axially displaceable rotatable turret top plate closing said open end and having a number of spaced apertures for holding tools and said top plate being coaxial with said central axis;
(c) an axially extending axially displaceable rotatable shaft connected to said top plate coaxial with said top plate;
(d) two opposed cooperating annular gears for seating said top plate to said body;
(e) one of said cooperating gears associated with said top plate and the other of said gears associated with said body;
(f) means rotating said shaft;
(g) means axially displacing said shaft and thereby said top plate for causing said cooperating gears to engage and disengage;
(h) rotation stopping means;
(i) angular rotation detection means determining the rotation of said shaft;
(j) control means cooperating with said rotation stopping means in response to said angular rotation detection means for operating said shaft rotating means and for activating said rotation stopping means when a selected one of said aperatures has rotated to a predetermined position;
(k) said shaft, said cooperating gears, said means displacing said shaft and said angular rotation detection means mounted substantially in said chamber;
(l) said body includes an auxiliary chamber;
(m) said shaft includes a radially extending flange with a ring gear mounted thereto;
(n) said shaft rotating means includes an air motor having gear means engaging and rotating said ring gear and thereby said shaft;
(o) said air motor mounted in said auxiliary chamber;
(p) means supplying air to said air motor;
(q) said auxiliary chamber includes a first aperture permitting engagement of said ring gear with said air motor gear; and,
(r) said auxiliary chamber further includes a second aperture communicating exhaust air of said air motor to said body chamber and pressurizing said body chamber during operation of said air motor and thereby preventing entry of contaminants into said body chamber.

4,524,656

METHOD FOR CUTTING METAL RODS INTO SHORTER LENGTHS

Marcello Del Fabro, and Giorgio Del Fabro, both of Udine, Italy, assignors to SAE s.r.l., Udine, Italy

Filed Sep. 27, 1983, Ser. No. 536,335
Claims priority, application Italy, Sep. 27, 1982, 83452 A/82
Int. Cl.³ B23D *33/02*
U.S. Cl. 83—23 **4 Claims**



1. A method for cutting metal rods into shorter lengths using apparatus including means for storing rods arranged in a fixed manner, parallel and arranged side by side in groups of bundles with homogeneous characteristics, the storing means being connected with at least one movable cutting line at the top end of the bundles of rods of said storing means, the cutting line being movable transversely and in alignment with the rods and comprising means for the extraction of rods from said stored bundles, shears disposed across the cutting line, means for advancing the rods longitudinally along the cutting line and means for determining the required length of the pieces to be cut, wherein the method comprises actuating said cutting line in accordance with the following steps:
extracting longitudinally from a predetermined bundle of rods of the storing means, taking for an initial distance less than the complete length of the bundle, a first bundle of rods;
transferring, from said first partially extracted bundle of rods on said cutting line, a set number of rods equal to or less than the number of rods in the partially extracted bundle of rods using a first extraction device, said set number forming a sub-bundle;
gripping said sub-bundle using a second extraction and feed device, drawing the sub-bundle along said line for subsequent extraction and cutting, and continuing such extraction until passing beyond the shears;
gripping said sub-bundle using a third extraction and feed device drawing the sub-bundle beyond said shears and continuing the extraction in association with said second extraction and feed device until a desired cutting length is reached;
cutting the sub-bundle of rods that has passed beyond said shears using the shears and unloading the cut pieces;
regripping said sub-bundle using the second extraction and feed device upstream of the shears and continuing the feeding of the sub-bundle beyond said shears;
regripping said sub-bundle using the third extraction and feed device downstream of said shears and continuing the feeding of said sub-bundle beyond the shears until the next required cutting length is reached;
cutting the next section of the sub-bundle of rods and repeating the cycle of the above steps until the entire length is used up;
unloading the last waste tailend section of the sub-bundle of rods along a different path;
transferring a new sub-bundle of rods from said first partially extracted bundle onto said cutting line for subsequent extraction, feed and cutting, using said first extraction device;
gripping said new sub-bundle of rods, using the second extraction and feed device upstream of said shears, and

continuing the extraction, feed and cutting following the steps previously set forth;

repeating the cycle of the transfer of sub-bundles from the first partially extracted bundle onto said line of further extraction, feed and cutting, until all of the first partially extracted bundle is used up;

during the procedure of further extraction, feed and cutting of said last sub-bundle, proceeding to a new successive partial extraction of a second bundle, using said first extraction device, from said stored bundles; and

resuming the cycle of transferring the sub-bundles onto said line of subsequent extraction, feed and cutting.

4,524,657

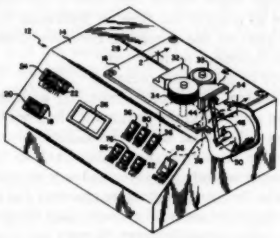
AUTOMATIC WIRE CUTTING MACHINE

Louis E. Griffith, Hampstead, N.H., assignor to Power Access Corporation, Manchester, N.H.

Filed Jun. 10, 1983, Ser. No. 502,944

Int. Cl.³ B26D *5/24*

U.S. Cl. 83—69 **11 Claims**



1. A machine for cutting lengths of cable comprising:

a drive roller for engaging the cable and driving it with no more than negligible slip;

a stepping motor for driving the drive roller;

means for setting a desired length of cable;

means for setting a number of lengths of cable which are to be cut to the set length;

means for counting drive cycles until the number of cycles corresponding to the set length have been counted;

means for driving the stepping motor, the stepping motor and roller driving a cable a length about equal to the length indicated by the least significant digit of the set length during each counted drive cycle;

cutter control means for disabling the stepping motor and for driving a cutting blade once the drive cycles corresponding to the set length have been counted, the cutter control means defining a delay from each drive of the cutting blade during each subsequent drive of the stepping motor such that the cutting blade is driven not less than a predetermined time after any previous cut;

means for counting the number of lengths of cable which have been cut; and

means for repeating the count of drive cycles, while driving the stepping motor, and the cutting of cable until the set number of lengths have been counted.

4,524,658

APPARATUS FOR PRODUCING PACKAGING BLANKS

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,638

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241636

Int. Cl.³ B31B *23/00*; B65B *41/12, 19/02*; B26D *7/06*

U.S. Cl. 83—152 **10 Claims**

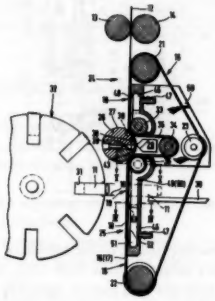
1. An apparatus for severing packaging blanks (10) from a web (12) of thin, highly flexible wrapping material, such as cellophane wrappers for cigarette packs, comprising:

(a) a pair of laterally spaced, endless, fluid permeable belts (16, 17),

(b) a plurality of spaced, axially parallel rollers (21–23, 33, 34, 36), including at least one driven roller, supporting the belts to define first and second successive coplanar conveyor runs (24, 25) separated by a diversion zone (35),

(c) first knife means (29) disposed at the diversion zone and extending laterally across the full width of a web conveyance path thereat,

(d) a conveyor roller (26) rotatably mounted at the diversion zone in surface contact with the belts at both an exit end of the first conveyor run and an entry end of the second conveyor run, said conveyor roller being provided with a plurality of suction holes (37),



(e) second knife means (28) embodied in the conveyor roller, extending laterally across the full width of the web conveyance path, and cooperable with the first knife means to sever successive blanks from a web,

(f) means for applying suction through the belts to regions of the first and second conveyor runs flanking the diversion zone, and through the holes to a peripheral sector of the conveyor roller extending substantially across the diversion zone,

(g) means (13, 14) for continuously supplying the web to an entry end of the first conveyor run, and

(h) means for removing severed blanks from the second conveyor run, whereby both the web and blanks severed therefrom are positively and continuously held against the first and second conveyor runs and against the peripheral sector of the conveyor roller during their transport and advancement through the diversion zone and the first and second knife means.

4,524,659

APPARATUS FOR CUTTING CONTINUOUS SLIDE FASTENER CHAIN

Akio Yunoki, NE. Marietta, Ga., assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,933

Claims priority, application Japan, Oct. 23, 1981, 56-170420

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—80 **3 Claims**

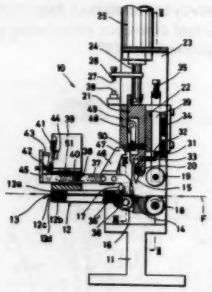
1. An apparatus for cutting a continuous intermittently gapped slide fastener chain into individual fastener lengths, comprising:

(a) a frame having a guideway for longitudinal movement of the chain;

(b) a pair of feed rolls disposed at the discharge end of said guideway for engaging opposite sides of the chain, and adapted to be intermittently driven;

(c) an anvil on said frame downstream of said feed rolls;

(d) a vertically reciprocable cutting punch assembly slidably supported on said frame in registration with said anvil;
(e) a pair of vertically opposed delivery rolls disposed downstream of said anvil for acting on opposite sides of a severed portion of the chain, said rolls being normally spaced apart to enable said feed rolls to drive any curled end of the advancing chain therebetween;
(f) means supporting one of said delivery rolls on said cutting punch assembly for vertical movement therewith toward the other of said delivery rolls, the latter being normally constantly rotating; and



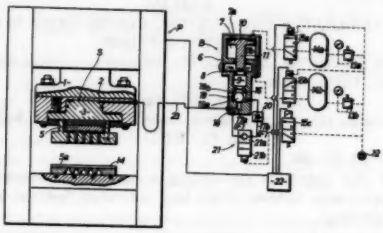
(g) control means responsive to the arrival of a gap in the chain for sequentially stopping said feed rolls, and lowering said one delivery roll and said punch assembly to thereby effect the cutting and the driven discharge of the severed portion, said control means including:
a control lever having a control prong, and being pivotally biased to urge said control prong against the chain and into a succeeding gap in the chain, said control lever being also yieldably longitudinally biased to be longitudinally shifted by the succeeding slide fastener by a selected amount to effect proper registration of the gap with the cutting punch assembly.

4,524,660

PNEUMATIC-HYDRAULIC DRIVING DEVICE FOR THE KNOCKOUT MECHANISM ASSOCIATED WITH THE SLIDE OF A PRESS-MACHINE

Keitaro Yonezawa, Itamishi, Japan, assignor to Aioi Seiki Kabushiki Kaisha, Hyogoken, Japan

Continuation of Ser. No. 266,787, May 26, 1981, abandoned.
This application Sep. 12, 1983, Ser. No. 531,573
Claims priority, application Japan, Jun. 2, 1980, 55-77094[U]
Int. Cl.³ B26D *5/12*; B60T *7/02*
U.S. Cl. 83—639 **10 Claims**



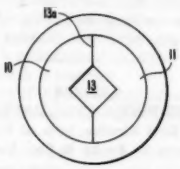
1. An improved pneumatic-hydraulic driving device for a knockout mechanism associated with the slide of a press-machine having a crank to move an upper die into and out of a corresponding lower die, which device comprises, in combination:
(a) a first casing;
(b) a pneumatic chamber disposed within the casing;
(c) an hydraulic chamber disposed within the casing adjacent to the pneumatic chamber;
(d) a slidable piston disposed in the pneumatic chamber and dividing the chamber into a driving chamber and a cushion chamber;
(e) a slidable plunger disposed in the hydraulic chamber, with the piston and plunger being connected for joint movement;
(f) an output port in the hydraulic chamber;
(g) an outlet port in the casing;
(h) a knockout piston slidably disposed in a knockout cylinder of the knockout mechanism;
(i) an actuating chamber formed above the knockout piston in the knockout mechanism;
(j) an hydraulic fluid passage providing communication between the output port and the actuating chamber through the outlet port;
(k) a charge valve means disposed in the hydraulic fluid passage to control the flow of hydraulic fluid from the output port to the actuating chamber while permitting flow in the opposite direction;
(l) a source of pneumatic pressure;
(m) first control means interconnected with the pneumatic pressure source and the pneumatic chamber to control the pressure differential across the slidable piston between a high value to supply hydraulic fluid to the actuating chamber at a high pressure, and a low value to supply hydraulic fluid to the actuating chamber at a low pressure;
(n) second control means for controlling the position of the charge valve means between its open and closed positions to control the flow of pressurized hydraulic fluid from the output port to the actuating chamber; and,
(o) switch means interconnecting the first and second control means with the crank of the press-machine such that low pressure hydraulic fluid is supplied to the actuating chamber as the crank moves from its top dead center to its bottom dead center and, after arriving at a predetermined position after passing its bottom dead center, high pressure hydraulic fluid is supplied to the actuating chamber to activate the knockout mechanism.

4,524,661

BOTTOM DIE CONSTRUCTION

Berthold Leibinger, Gerlingen, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,590
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136514
Int. Cl.³ B26F *1/14*; B26D *1/00*
U.S. Cl. 83—690 **1 Claim**



1. A bottom die with a closed cutting edge for a stamping machine having a seat for a bottom die, comprising:
a bottom die body comprising two separate body parts (10,11) adapted to be assembled together and together forming a cylindrical exterior surface with an internal die cutting edge (12) defining a die cutting opening, said body

parts being separable along a parting line (**13***a*) which extends transversely across said die cutting opening;

a fixture (**8**) into which said body parts (**10,11**) are assembled, said fixture having a cylindrical outer surface (**8***a*) of a size to be received in the seat of the stamping machine, a top surface (**8***e*) and a bottom surface (**8***f*), said fixture also having a through opening (**8***b*) of a size larger than said die cutting opening (**13**) and a recess defined between a cylindrical intermediate surface (**8***c*) of said fixture facing said through opening and a shoulder surface (**8***d*) disposed above said bottom surface (**8***f*) and bounding said through opening, said cylindrical exterior surface of said die body being substantially equal in diameter to said cylindrical intermediate surface (**8***c*), said die body (**10,11**) being disposed in said recess; and

a fastening screw connected between said fixture and each die body part to hold said die body in said recess, each fastening screw extending in a direction parallel to said parting line (**13***a*);

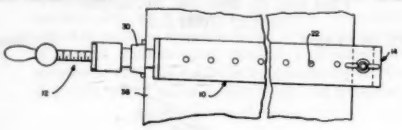
said fixture having said opening (**8***b*) thereof extending from said bottom surface (**8***f*) thereof to said shoulder surface (**8***d*) thereof through which each screw extends, each screw being threaded into each die body part respectively, said die body having a top surface (**10***a*, **11***a*) and a bottom surface, said top surface of said die body being coplanar with said top surface of said fixture and said bottom surface of said die body being engaged on said shoulder surface of said fixture.

4,524,662

STRAIGHT-CUT GUIDE FOR SAWS

Rickey L. Carley, 787 Riverside Dr., Ukiah, Calif. 95482

Filed Feb. 17, 1983, Ser. No. 467,199
Int. Cl.³ B27B *9/04*
U.S. Cl. 83—745 **2 Claims**



1. A saw guide comprising:

a. a rigid structural guide member having disposed at one end thereof a vertical flange with a threaded pipe section attached thereto, said guide member having a plurality of holes along the axis thereof;

b. a screw driven holding clamp attached to said rectangular guide member for adjustably positioning said guide relative to one end of a work piece, said screw driven holding clamp comprising a guide ring having a depending flange which provides an abutment for engaging the end of said work piece, said guide ring being loosely accomodated around said screw threaded pipe section of said guide member, a screw threaded driver for clamping said depending flange against said work piece, said driver connected to said depending flange at one end and having a driving handle attached to the opposite end, and a threaded attaching ring for connecting said holding clamp to said guide member, said attaching ring having two spatially separated adjacent screw threaded openings, one of said threaded openings providing a passage for said screw threaded driver at an intermediate distance between said guide ring and said driving handle and the other said threaded opening being attached to said screw threaded pipe section of said guide member;

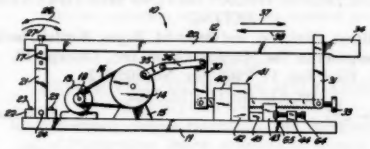
c. a stop clamp providing a second abutment for engaging the opposite end of said work piece, said stop clamp being adjustably positioned along said guide member at varying distances from said holding clamp by selective positioning of securing means within said holes in the guide member thereby accommodating work pieces of different sizes.

4,524,663

POWER HACKSAW

Ray E. Boyer, and Harriet S. Boyer, both of P.O. Box 18451, Rte. 2-30, Massena, N.Y. 13662

Filed Sep. 20, 1983, Ser. No. 533,922
Int. Cl.³ B27B *11/00*
U.S. Cl. 83—762 **12 Claims**



1. A power actuated saw comprising:

(a) a base;

(b) means for holding a saw blade;

(c) drive means coupled to said holding means for providing a substantially reciprocating motion to said holding means and the saw blade;

(d) guide means for aligning and enhancing the cutting force of the saw blade including;

(i) a vertical raceway, disposed adjacent to said base, said raceway having an enclosure and having a slot for receiving the saw blade;

(ii) a block member disposed in the enclosure of said raceway for contacting the top of the blade so as to exert a downward force on the blade towards the base, said block member being movably disposed in only a vertical direction within said enclosure of said raceway; and

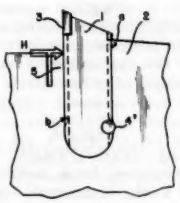
(iii) a pair of vertical roller members coupled to the bottom of said block member for exerting horizontal forces on the saw blade and aligning the blade in the direction of reciprocation.

4,524,664

ELASTIC MOUNTING FOR THE ROD-SHAPED TOOTH OF A CUT-OFF SAW

Jorma A. K. Tuomaala, Oulu, Finland, assignor to Teratuote Oy, Toijala, Finland

Filed Jun. 27, 1983, Ser. No. 508,089
Claims priority, application Finland, Mar. 17, 1983, 830883
Int. Cl.³ B27B *33/12;* **B23D** *61/04*
U.S. Cl. 83—840 **6 Claims**



1. In the mounting of a saw tooth on a circular saw blade which has a blade axis and body with a blade body edge,

a saw tooth notch formed on the edge of the blade body of said circular saw blade, said notch comprising opposed leading and following edges joined by a curved notch bottom having front and rear corners,

a saw tooth having a rear surface which is supported to be

pressed against the rear corner of the tooth notch which is further away relative to the blade axis,

an elastic strip pressing the tooth front surface,

and a locking rivet mounted on said blade body adjacent to the bottom of the tooth notch and pressing the leading tooth edge against the leading edge of the notch, said rivet being positioned behind the tooth and adjacent to the notch bottom.

4,524,665

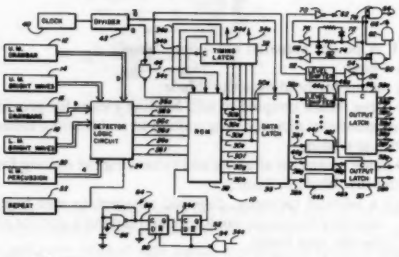
DYNAMIC CONTROLLER FOR SAMPLING CHANNELS IN AN ELECTRONIC ORGAN HAVING MULTIPLEXED KEYING

Angelo A. Bione, Elmhurst, and Brian M. Bagus, Bartlett, both of Ill., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Jun. 17, 1983, Ser. No. 505,312

Int. Cl.³ G10H *1/18, 7/00*

U.S. Cl. 84—1.01 **5 Claims**



1. A dynamic controller circuit for use in a multiplexed organ having a plurality of channels, a detector means having a plurality of output lines and being connected to each of said channels for providing an output signal on respective ones of said output lines to indicate that a respective channel contains an information signal, and means connected to each channel for sampling said channel information signal, said dynamic controller comprising:

a memory for receiving said output signals from said detector means as an address and having a plurality of digital sequences stored at different memory locations and having a plurality of memory output lines;

a clock circuit for providing a timing signal to said memory;

said timing signal having a first polarity and a second polarity;

said memory upon receiving said address signals from said detector means and said first polarity timing signal places a sequence of digital signals for use as timing signals upon at least some of said memory output lines,

a timing latch connected to said at least some of said memory output lines for receiving said sequence of digital signals for use as timing signals and having a plurality of timing output lines for providing counting signals; and

at least some of said output lines of said timing latch connected to the input of said memory.

4,524,666

MUSICAL TONE FORMING SYSTEM

Mitsumi Kato, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hammatsui, Japan

Filed Sep. 12, 1983, Ser. No. 531,437

Claims priority, application Japan, Sep. 14, 1982, 57-160277

Int. Cl.³ G10H *1/02, 1/40, 7/00*

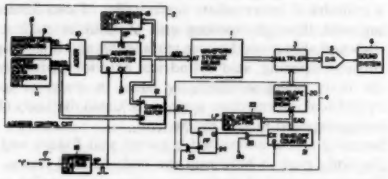
U.S. Cl. 84—1.03 **4 Claims**

1. A musical tone forming system comprising:

(a) waveform storage means for storing data representative of an attack portion of a musical tone waveform of a percussion instrument and data representative of part of the portion of said musical tone waveform following said attack portion, said data representative of said part being stored at consecutive storage locations beginning at a certain repeat address;

(b) random data generating means for generating random data varying with time;

(c) address calculation means for calculating random repeat starting addresses by combining said certain repeat address with said generated random data; and



(d) address means for addressing said waveform storage means to first read the data representative of said attack portion and to then repeatedly read said part from said waveform storage means to thereby form a musical tone signal of said percussion instrument, said addressing means carrying out every repeated reading of said part in one scan direction only, and beginning the scan on each repeated reading from a respective random repeat starting address provided by said address calculation means.

4,524,667

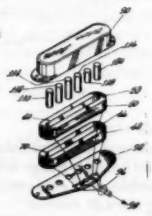
ELECTROMAGNETIC PICKUP FOR A STRINGED MUSICAL INSTRUMENT HAVING FERROMAGNETIC STRINGS AND METHOD

Seymour Duncan, P.O. Box 4746, Santa Barbara, Calif. 93103

Filed Aug. 15, 1983, Ser. No. 523,067

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.15 **13 Claims**



1. An electromagntic pickup adapted for use with a multistringed musical instrument having strings formed of a ferromagnetic material comprising

a first coil having wire wound in a first direction and in an elongated oval shape having a major and minor axis, said first coil having a first geometrical distance along the major axis which exceeds the distance between the outermost strings of a multistringed musical instrument adapted to use the electromagnetic pickup and a second geometrical distance along the minor axis which is substantially less than that along the major axis, said first coil including means defining a first opening which extends through the interior thereof;

a second coil having wire wound in a second direction and in an elongated oval shape having major and minor axes and the geometrical dimensions of which are substantially equal to that of said first coil, said second coil including means defining a second opening which extends through the interior thereof, said second coil being positioned in a spaced opposed aligned relationship with said first coil with the first opening of said first coil in axial alignment

with the second opening of said second coil positioning the major axis of said first coil in a spaced parallel aligned relationship with the major axis of said second coil forming a coil stack assembly having a hollowed-out central cavity defined by said first opening communicating with said second opening;

a permanent magnet means having a north magnetic pole and a south magnetic pole positioned in said hollowed-out central cavity with one of said north magnetic pole and south magnetic pole positioned therein so as to be adapted to be adjacent to and to magnetically couple with a string of a said multistringed musical instrument and with the other of said north magnetic pole and south magnetic pole positioned therein so as to be adapted to be remote to a string of a said multistringed musical instrument;

said permanent magnetic means further including

a plurality of spaced, cylindrically shaped permanent magnet elements having an axial length which enables the permanent magnet elements to be located within the hollowed-out central cavity and a diameter which is less than the second geometrical dimension of the minor axis of said first opening and said second opening and wherein at least two of the cylindrically shaped permanent magnet members have different axial lengths, said cylindrically shaped permanent magnetic elements being positioned in said hollowed-out central cavity with the axes thereof in spaced parallel relationship to each other; and

coil connecting means operatively coupled to said first coil and said second coil to selectively connect the same in at least one of series opposition, parallel opposition and selected single coil configuration, said coil connecting means and coil stack assembly being adapted to produce a magnetic field which traverses a path from the hollowed-out central cavity of the coil stack assembly, through said permanent magnet means to a said string of a said multistringed musical instrument formed of ferromagnetic material defining a magnetic flux path, the reluctance of which is varied in response to the vibration of a said string of a said multistringed musical instrument which is adapted to vary the magnetic field inducing a voltage into said coils which varies in amplitude and frequency.

4,524,668

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF PERFORMING NATURAL SLUR EFFECT

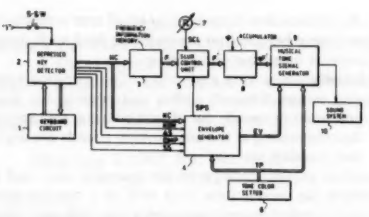
Norio Tomisawa; Yasuji Uchiyama, and Hideo Suzuki, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 15, 1982, Ser. No. 434,604

Claims priority, application Japan, Oct. 15, 1981, 56-163509

Int. Cl.³ G10H *1/053, 7/00*

U.S. Cl. 84—1.24 **23 Claims**



1. An electronic musical instrument, comprising:

musical tone signal generating means for generating a musical tone signal gradually changing in musical tone pitch from that corresponding to a firstly-depressed key to that corresponding to a secondly-depressed second key in a keyboard;

amplitude generating means for generating an amplitude coefficient gradually varying from a first amplitude coefficient for the musical tone generated by the first key to a second amplitude coefficient for the musical tone generated by the second key, said gradual variation in amplitude ceefficient being coordinated with said gradual variation in said musical tone signal; and

musical tone signal control means for controlling the amplitude of the musical tone signal generated by said musical tone signal generating means in accordance with the varying ampllitude coefficient generated by said amplitude coefficient generating means to thereby produce a musical tone signal varying gradually in amplitude in coordination with the variation in pitch of the musical tone.

4,524,669

KEY-DRIVING/DETECTING MECHANISM FOR KEYBOARD INSTRUMENT

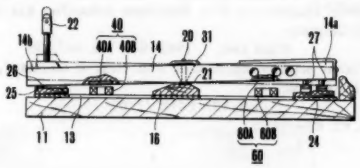
Jun Yamamoto; Hajime Hayashida, and Hiroyoshi Takahashi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 24, 1982, Ser. No. 381,715

Claims priority, application Japan, Jun. 11, 1981, 56-85999[U]; Jun. 12, 1981, 56-91119

Int. Cl.³ G10C *3/12*

U.S. Cl. 84—433 **14 Claims**



1. A key-driving/detecting mechanism for a keyboard instrument comprising:

a plurality of keys arranged on a key bed;

each key being rotatable about a balance pin secured to said key bed;

a first electromagnetic device interposed between a lower surface of each key and said key bed at a position in rear of said balance pin, each of said first devices comprised of an electromagnetic coil and a permanent magnet; and

a second electromagnetic device interposed between said lower surface of each key and said key bed at a position in front of said balance pin, each of said second devices comprised of an electromagnetic coil and a permanent magnet.

4,524,670

SECURING APPARATUS FOR MODULES CARRIED ON AIRCRAFT, IN PARTICULAR FOR FLARE LAUNCHING MODULES

Alain A. Billard, Muret; André R. Santalucia, Leguevin, and Christian Breseghello, Saverdun, all of France, assignors to Societe E. Lacroix-Tous Artifices, Muret, France

Filed Jun. 1, 1982, Ser. No. 384,097

Claims priority, application France, Jun. 3, 1981, 81 10974

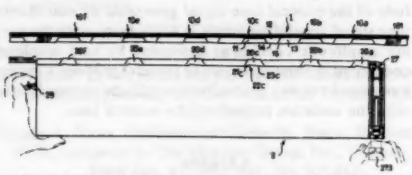
Int. Cl.³ F41F *5/00;* **B64D** *1/04*

U.S. Cl. 89—1.53 **10 Claims**

1. Securing apparatus for modules carried on board a craft, comprising a support rod mounted to a craft for engagement and disengagement of a replaceable module, the rod being elongated and provided with a series of female engagement members and associated notches distributed along the length of the rod with unequal separations (L1, L2, L3, . . .) of the members established according to a predetermined geometric progression in which

$$(L2/L1)=(L3/L2)=\ldots=q$$

for dissipation of vibrations, the module being provided with counterpart male engagement members separated according to



the same geometric progression as the female members on the support rod for insertion in the notches and engagement with the female members, the female and male engagement members also providing dovetail engagements for securely fixing the module to the craft.

4,524,671

ANTIFRICTION BEARING FOR LONGITUDINAL DISPLACEMENT GUIDANCE OF A GUN BARREL

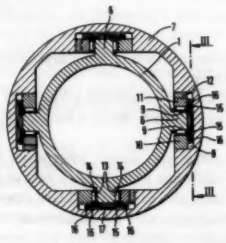
Rolf Bender, Bad Vilbel; Werner Jacob, Frankfurt am Main, and Horst Pfuderer, Dietzenbach, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,506

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150250

Int. Cl.³ F41F *17/02, 19/00*

U.S. Cl. 89—14.05 **4 Claims**



1. A rolling bearing arrangement for guidance of a gun barrel during longitudinal displacement comprising a gun barrel having at least three circumferential axis-parallel strips projecting radially outward, each strip having two bearing surfaces parallel to each other and to a radial plane, which surfaces in turn are associated with directly opposite bearing surfaces or elements extending parallel thereto in a housing surrounding the gun barrel, and two flat cages each containing a set of cylindrical rollers arranged between the bearing surfaces of the strip and the directly opposite bearing surfaces of the housing, the two sets of rollers cooperating with each strip being under tension by the arrangement, by at least one of the elements being displaceable perpendicular to the strip.

4,524,672

MAGAZINE AND FEED MECHANISM FOR FIREARMS

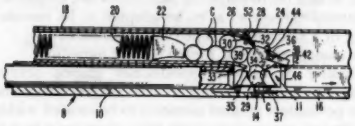
Walter Balsavage, 222 Tantum Dr., Trenton, N.J. 08610

Filed Apr. 27, 1983, Ser. No. 489,280

Int. Cl.³ F41C *25/04*

U.S. Cl. 89—33.1 **19 Claims**

1. In a magazine and feed mechanism for a firearm having a receiver, a magazine mounted thereon and adapted to hold a plurality of cartridges arranged to be fed from the magazine in successively following order, a transfer disc rotatably mounted in the receiver and having a slot receiving the cartridge that is leading in the sense of the order in which the cartridges are fed from the magazine, in a position in which the leading cartridge initially extends transversely of the barrel and thereafter is alignable longitudinally therewith on rotatable movement of the disc, and a transfer disc actuating arm slidably movable in the receiver between a retracted position in which the disc receives the transversely disposed lead cartridge and an advanced position in which the arm rotates the disc to align the cartridge with the barrel, the improvement comprising:



(a) a flap on the magazine normally preventing feeding of the lead cartridge from the magazine to the disc;

(b) cartridge feed means movable between a normally retracted position and an advanced position in which it biases the lead cartridge past the flap and into the cartridge slot; and

(c) means for biasing the feed means to its advanced position responsive to return movement of the actuating arm from its advanced to its retracted position.

4,524,673

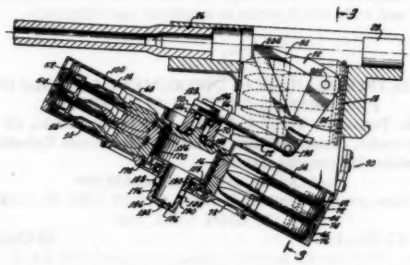
GUN POWERED AMMUNITION MAGAZINE

Michael D. Golden, Costa Mesa, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Sep. 29, 1982, Ser. No. 428,283

Int. Cl.³ F21C *25/10*

U.S. Cl. 89—33.02 **15 Claims**



1. An ammunition magazine for small arm weapons having a reciprocating bolt and an ammunition feed well therein, said ammunition magazine comprising:

a housing for storing a plurality of ammunition rounds;

spring means disposed within said housing for urging said ammunition rounds out of said housing, said spring means decompressing as the ammunition rounds are urged out of said housing;

conduit means, configured for insertion into and removal from the ammunition feed well of a small arm weapon, said conduit means communicating with said housing for passing ammunition rounds from said housing through the conduit means, and into a position within the small arm weapon for engagement by the reciprocating bolt of the small arm weapon when the conduit means is inserted into the small arm weapon ammunition feed well; and,

means, communicating with said spring and associated with said conduit means, for engaging the reciprocating bolt and causing movement of the reciprocating bolt to com-

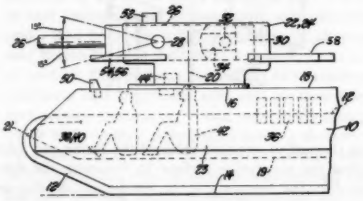
press the spring means when the conduit means is inserted into the small arm weapon ammunition feed well.

4,524,674

MILITARY VEHICLES

Jaunutis B. Gilvydis, Oakland County, Mich., assignor to The Unites States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 24, 1983, Ser. No. 460,323
Int. Cl.³ F41H *5/00*
U.S. Cl. 89—36 H **14 Claims**



1. In a military vehicle that comprises a hull having a roof, a platform disposed on the roof for rotary motion in the azimuth plane, two parallel walls projecting upwardly from the platform to define a gun cradle; a main gun located within the defined cradle; pivot means supporting the gun for adjusting movements in the elevational plane around a pivot axis transverse to the cradle walls; two personnel stations within the hull forwardly from the platform; and ammunition storage magazine means within the hull rearwardly from the platform: the improvement comprising means for protecting the personnel stations and magazine means from overhead attack; said protecting means comprising first, second and third armor plates carried by the cradle walls an appreciable distance above the hull roof; each armor plate being essentially horizontal when the vehicle is on level ground; a first one of the armor plates overlying one of the personnel stations when the platform is in a forward-fire position; a second one of the armor plates overlying the other personnel station when the platform is in a forward-fire position; a third one of the armor plates overlying the magazine means when the platform is in a forward-fire position.

4,524,675

DETACHABLY CONNECTABLE SIGHT ASSEMBLY FOR A SMALL DEFENSE WEAPON

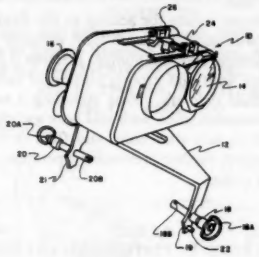
Peter Durenec, Annandale, and Clifford E. Lowe, Fredricksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1982, Ser. No. 404,783
Int. Cl.³ F41G *1/38*
U.S. Cl. 89—41.03 **8 Claims**

1. A sight assembly that is detachably connectable to a small defense weapon, said assembly comprising:

a mounting cradle; and

a sight, said sight having a belt-type bracket that is screw-tightened about the sight and is connected to a plate of the mounting cradle, said plate having a front leg and a rear leg which extends down therefrom and to which are attached front or rear connecting/disconnecting means respectively; and wherein the front leg and the rear leg each are provided with antirocking means to prevent rocking of the sight assembly, when attached to a weapon,



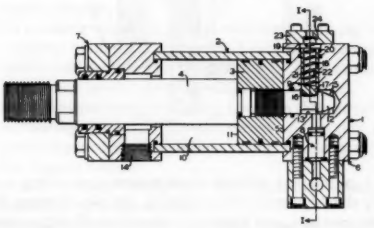
about points of attachment of the connecting/disconnecting means.

4,524,676

HYDRAULIC CYLINDER LOCKING DEVICE

Larry K. Rogers, Lexington, Ky., assignor to American Standard Inc., Lexington, Ky.

Filed Jan. 19, 1984, Ser. No. 572,265
Int. Cl.³ F15B *15/26*
U.S. Cl. 91—43 **13 Claims**



1. A hydraulic cylinder with a locking device comprising:

(a) a cylinder body having a piston chamber formed therein and a head end on at least one end;

(b) a piston member reciprocally movable within said piston chamber;

(c) a stud member secured to said piston for reciprocal movement therewith, said stud member being axially movable within a stud bore formed in said head end such that, said stud bore is sealed into a variable volume stud chamber, said stud member having a groove portion and a stud portion, said stud portion being of smaller dia.neter than said stud bore;

(d) a plunger means extending through at least a portion of said head end having plunger surfaces for engaging said groove portion of said stud member;

(e) urging means for forcing said plunger means into engagement with said stud member;

(f) said plunger means being in fluid communication with said variable volume stud bore such that, upon travel of said stud member into said stud bore, said plunger means is forced in a direction opposite said urging means;

(g) fluid regulating means in communication with said stud bore for exhausting the fluid pressure in said stud bore following movement of said stud portion past said plunger surfaces, said fluid regulating means including a first check valve disposed as an outlet valve to said stud bore, said first check valve remaining closed until such fluid pressure in said stud bore increases under the influence of such stud portion movement sufficiently to urge said plunger means out of frictional contact with said stud

portion, said first check valve thereafter opening upon such fluid pressure reaching a first predetermined cracking value; and

(h) fluid delivery means for adding to the fluid pressure in said stud bore such that such fluid pressure acts on said plunger surfaces and said plunger member is forced out of engagement with said groove portion of said stud member, said fluid delivery means including a second check valve in communication with said bore and disposed as an inlet valve to said stud bore, said fluid delivery means, when engaged, further preventing operation of said fluid regulating means.

4,524,677

SEALS USED IN PISTON AND CYLINDER ARRANGEMENTS

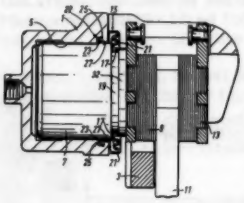
Glynn Ashman; Kelvin T. Berry, and Martin E. Winterbottom, all of West Midlands, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 29, 1982, Ser. No. 445,232

Claims priority, application United Kingdom, Dec. 1, 1981, 8136199

Int. Cl.³ F16J *15/18*

U.S. Cl. 92—168 **4 Claims**



1. A piston and cylinder arrangement comprising a piston axially slidably located in a cylinder, the piston being slidable at least partially, out from one open end of said cylinder, a retaining groove on the inside wall of the cylinder adjacent the open end thereof, said groove having a bottom wall joining axially spaced front and rear walls, a pressure seal received in said groove and compressed radially of the cylinder between the outer wall of the piston and the bottom of the retaining groove with sufficient force to resist fluid pressure applied to said piston, said pressure seal being the sole sliding seal between said piston and cylinder wall, said piston having a portion extending forwardly of said groove in said cylinder when said piston is in its fully retracted position, and a flexible boot having one end sealingly engaging the forwardly extending portion of said piston and its opposite end joined to said pressure seal, the diameter of said cylinder between its open end and the front wall of the groove in said cylinder being enlarged to allow passage of said flexible boot from the exterior of said cylinder to said pressure seal.

4,524,678

DAMPER WITH INTEGRAL SUPPORT

Steven L. Klebanoff, Westchester County, N.Y., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed Dec. 6, 1982, Ser. No. 447,470

Int. Cl.³ F24F *11/00*

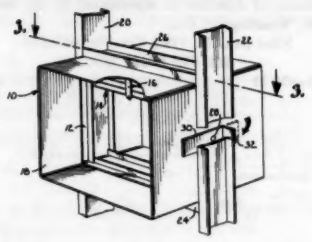
U.S. Cl. 98—1 **1 Claim**

1. A prefabricated protective damper to be secured in a postion for blocking flow through a building passageway defined by a pair of generally parallel, spaced apart, longitudinally extending construction members, there being a member at each side of said passageway, said damper including:

a rigid, peripherally extending, rectangular frame defining a damper opening, said frame having a pair of substantially parallel sides having generally flat outer surfaces;

automatically actuatable means mounted on the frame for blocking fluid flow through the damper opening responsvie to elevation of the ambient temperature beyond a predetemined limit; and

a pair of elongated, bendable straps of flat sheet steel material, said respective straps being secured intermediate the



ends thereof to opposite sides of the frame and lying flat against the respective surface to minimize the space required for the damper prior to installation, the free ends of each strap being bendable away from the damper side surface into embracing relationship with a corresponding proximal construction member to quickly and easily secure the damper in fixed position across said passageway and against dislodgement from said position under the influence of substantial fluid forces against the damper.

4,524,679

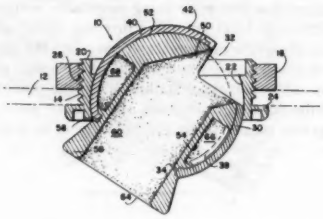
AIR VALVE

Harold W. Lyons, Deep River, Conn., assignor to Whelen Engineering Co., Inc., Deep River, Conn.

Filed Oct. 19, 1983, Ser. No. 543,340

Int. Cl.³ F24F *13/10*

U.S. Cl. 98—40.02 **17 Claims**



1. An air flow control valve for use in establishing fluid communication between a source of pressurized air and an enclosure, said valve comprising:

socket defining means, said socket defining means having a pair of oppositely disposed openings which lie in parallel planes, said openings being symmetrical with respect to a first axis which is transverse to said planes, said socket defining means further having a concave interior bearing surface which is symmetrical with respect to said first axis;

housing means, said housing means consisting of a pair of interlocking shell-defining members, said shell-defining members cooperating to form a thin-walled hollow shell having a generally truncated spheroidal interior shape and an external shape which is at least in part complementary to that of said socket defining means interior bearing surface whereby said housing means is rotatably supported in said socket defining means, said shell having an interior locking surface portion which deviates from said

spheroidal interior shape, said shell further having a circular shaped discharge port extending through the wall thereof, said discharge port lying in a plane, the valve having a directional axis which is transverse to the plane of said discharge port and coaxial therewith, said directional axis passing through the center of the sphere defined by said members, said shell also having an inlet port extending through the wall thereof, said inlet port being spacially displaced from said discharge port and being off-set with respect to said directional axis; and

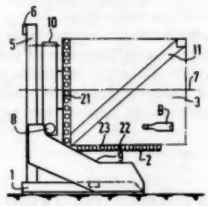
a valve body movably supported within said housing means, at least a portion of said valve body having an exterior shape which complements the spheroidal interior shape of said housing means shell, said valve body defining a single unimpeded non-linear air flow passage which extends between an inlet port and a discharge port, a first portion of said passage being co-axial with said directional axis, said valve body discharge port being in alignment with said housing means shell discharge port, a second portion of said air flow passage having an axis which angularly intersects said directional axis, said air flow passage second portion terminating at said valve body inlet port, said valve body further including an exterior surface irregularity which engages said housing means shell locking surface to limit the relative motion between said valve body and said housing means to rotation about said directional axis, rotation of said valve body about said directional axis permitting the degree of overlap of said valve body inlet port and said housing means shell inlet port to be varied to thereby vary the rate of flow through the valve, application of a force having a component which is transverse to said directional axis to said valve body causing simultaneous rotation of said housing means and valve body to vary the relative angular orientation of said first and directional axes between the condition of alignment and various degrees of non-alignment to thereby selectively direct the air discharged from said valve body discharge port.

4,524,680

DEVICE FOR RIDDLING BOTTLES ACCORDING TO THE CHAMPAGNE METHOD

Roger G. Jeanrat, Ay; Pierre M. Martin, Reuil, and Georjes Hardy, Epernay, all of France, assignors to Methode Champenoise Automatisee-M C.A. G.I.E., Magenta, France

Filed Apr. 26, 1984, Ser. No. 604,074
Claims priority, application France, May 11, 1983, 83 07864
Int. Cl.³ C12H *1/22*
U.S. Cl. 99—277.1 **10 Claims**



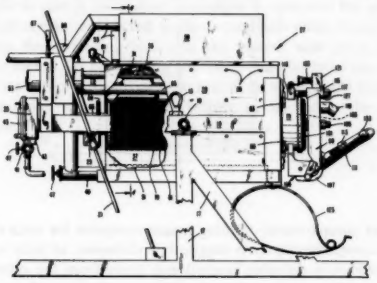
1. A riddling device for processing wine according to the champagne method, the device comprising a stand, a cradle capable of pivoting through a right angle relative to the stand, and a platform capable of rotating about an axis disposed in the middle of the cradle, the platform being suitable for receiving a pallet-crate containing bottles, wherein one of the ends of the cradle is hinged to a moving support which is capable of vertical translation, and wherein the opposite end of the cradle is fitted with two wheels which rest on slopes on the stand.

4,524,681

METHODS AND APPARATUS FOR THERMAL BLAST FEELING, SKINNING, OR SHELLING OF FOOD PRODUCTS

Hubert Harris, and Durward A. Smith, both of Auburn, Ala., assignors to Auburn Research Foundation, Auburn, Ala.

Division of Ser. No. 554,814, Nov. 23, 1983,. This application Jun. 18, 1984, Ser. No. 621,739
Int. Cl.³ A23N *7/00*
U.S. Cl. 99—474 **23 Claims**



1. An apparatus for thermal blast removal of coverings from food products comprising:

(a) furnace means including a combustion chamber having a burner therein;

(b) a pressure vessel having exterior walls defining a vessel chamber mounted for controlled movement substantially within said furnace means, the exterior walls of said pressure vessel being heated by said furnace means:

(c) said pressure vessel including a portion thereof extending outwardly from said furnace means and having a door means controlling an opening having an axis perpendicular thereto therein;

(d) said furnace means and said pressure vessel being mounted on frame means;

(e) means associated with said door means for controllably and substantially instantaneously opening said door means by moving said door means in a direction away from said vessel chamber and said axis; and

(f) means supplying fluid heated by said furnace means to said vessel chamber, said heated fluid pressurizing and heating said vessel chamber and said food products located therein, and actuation of said means associated with said door means causing substantially instantaneous depressurization of said vessel chamber to atmospheric pressure.

4,524,682

APPARATUS FOR CONDITIONING WAFERS

Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 7, 1983, Ser. No. 558,936
Claims priority, application Austria, Dec. 23, 1982, 4678/82
Int. Cl.³ A23B *4/04*
U.S. Cl. 99—477 **42 Claims**

1. In apparatus for conditioning wafers having an area up to a predetermined area, comprising

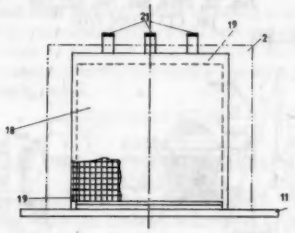
means defining an insulated conditioning chamber and a feed opening and a discharge opening communicating with said conditioning chamber, which is closed except for said feed and discharge openings,

a conveyor, which extends in said conditioning chamber and adjacent to said feed and discharge openings and is operable to revolve in a predetermined direction of travel and

carries compartment-defining means, which define compartments arranged one behind the other in said direction of travel and adapted to receive respective wafers, and

means for delivering conditioning air streams flowing in contact with wafers in said compartments,

the improvement residing in that



said compartment-defining means comprise for each of said compartments two supporting elements, at least one of which is movable toward and away from the other and which are adapted to support a wafer in said compartment, and

the area of each of said supporting elements is at least one-half said predetermined area.

4,524,683

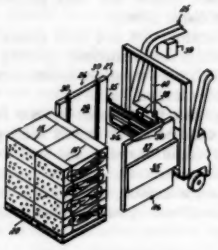
METHOD OF IMPROVING THE HANDLING OF TOBACCO

Samuel S. Parker; Charles W. Marshall, both of Maysville, Ky., and Durward G. Money, Aberdeen, Ohio, assignors to Parker Tobacco Company, Inc., Maysville, Ky.

Filed Jan. 9, 1984, Ser. No. 569,045

Int. Cl.³ B65B *13/20*

U.S. Cl. 100—3 **5 Claims**



1. A method of compressing and banding bales of oriented tobacco leaves without altering leaf orientation in the bales, the leaves in the bales being oriented parallel to the bases of the bales, comprising:

assembling a stack of bales on a pallet or other surface with all the bales turned so that the leaves therein are on edge and vertical to the support;

engaging two opposite sides of the stack so formed by vertical clamping platens mounted to the jaws of a forklift truck, the platens being placed parallel to the planes of the leaves in the bales;

pressing the stack between the platens by bringing the platens closer together in the direction perpendicular to the planes of the leaves, and compressing the leaves in the direction perpendicular to their planes;

raising the jaws while holding the stack of bales compressed between the clamps, thereby lifting the stack from the surface;

rotating the jaws, with the stack between them, so that the platens and leaves are then essentially horizontal;

passing strapping bands or ties around the stack through grooves in the platens adjacent the bales while the bales are still compressed, and securing the bands or ties to hold the bales in a compressed state;

turning the jaws, while still supporting the stack, back to an orientation in which the leaves are again vertical and on edge; and

releasing the compressed and banded stack from between the platens.

4,524,684

CONTINUOUS PRESS

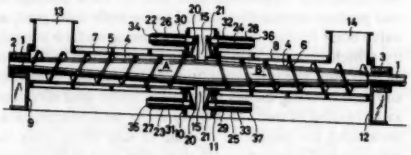
Hachiro Sato, Tokyo, Japan, assignor to Fukoku Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,149

Claims priority, application Japan, Sep. 10, 1982, 57-137592

Int. Cl.³ B30B *9/16*

U.S. Cl. 100—117 **10 Claims**



1. A continuous press comprising:

a frame;

a driving shaft journaled to the frame at its both ends by means of thrust bearings;

a screw drum disposed around the driving shaft to rotate therewith;

first and second screw blades disposed around the outer surface of said screw drum;

an outer drum arranged around the screw blades and having a number of small filtering holes;

an inlet provided in said outer drum for introducing raw materials into a space formed by the screw drum, first and second screw blades and outer drum;

an outlet provided in said outer drum for discharging the pressed raw materials as a cake;

first and second ring-shaped plates arranged opposite to each other at the outlet, an inner diameter of the ring-shaped plates being larger than that of the outlet of the outer drum so that the pressed cake is urged against only an inner surface of the plates and is guided outwardly in a radial direction of the outer drum;

means secured to the frame for supporting at least one of the plates movably in an axial direction of the press; and

means secured to the frame for resiliently pressing said at least one of the plates towards each other; whereby said space is gradually made smaller than said inlet to said outlet.

4,524,685

EQUIPMENT FOR COMPACTING TRASH CONSISTING OF PACKING MATERIALS AND EASILY COMPRESSED WASTES

Heinz Bergmann, Im Ründrdiek 1, D-4474 Lathen, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,231

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238261; Jul. 19, 1983, 3326007

Int. Cl.³ B30B *3/02*

U.S. Cl. 100—210 **40 Claims**

1. In apparatus for compacting trash in a container open at the top which cooperates with compacting roller means enter-

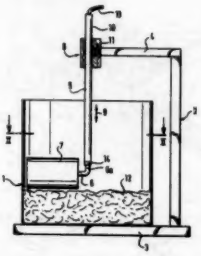
ing the container and revolving within it on said trash in a circular manner while being supported from above said container, said compacting roller means carrying out a relative motion with respect to said container during compaction as said container is being filled, the improvement comprising:

(a) a base under said container;

(b) a post having a bottom end on said base and extending vertically from said base to an upper end;

(c) an arm extending horizontally and having a first end on said upper end of said post and a second end over said container;

(d) lifting means on said second end;



(e) a vertical shaft adapted for engagement with said lifting means and having one end engaging said lifting means and another end;

(f) at least one horizontal support provided at said another end;

(g) said compacting roller means rotatably mounted on said horizontal support and resting on said trash by its own weight; and

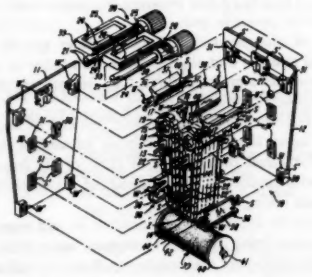
(h) means for subjecting said compacting roller to continuously alternating forward and backward motion within said container.

4,524,686

PRINT HEAD AND METHOD OF MAKING SAME

Donald L. Karn, Springboro, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 30, 1983, Ser. No. 527,727
Int. Cl.³ B41J *1/60*
U.S. Cl. 101—111 **10 Claims**



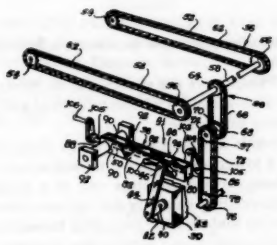
1. A print head having a pair of spaced first and second side plates, a mounting block, drive wheels rotatably mounted by the mounting block, the drive wheels having central holes defining a continuous axial opening, printing bands coupled to the drive wheels, the second side plate having means defining an opening, a selector extending through the opening in the second side plate and received in the continuous opening, means on the selector for engaging any selected wheel to advance any selected printing band, guide means connecting the first and second side plates, an indicator member coupled to the selector and slidably mounted by the guide members for indicating the printing band with which the selector is coupled, the selector being rotatable relative to the indicator member, the indicator member being shiftable in the axial direction as a unit with the selector, means for locating the guide members with respect to the first side plate, wherein the locating means includes releasable snap-connectors, snap-fit means for connecting the guide members to the second side plate sufficiently strongly so that if the second side plate is removed the guide members remain connected to the second side plate, means for locating the mounting block to the second side plate, and snap-fit means for connecting the mounting blocks to the first side plate sufficiently strongly so that if the second side plate is removed the mounting blocks remain connected to the first side plate.

4,524,687

ADJUSTABLE CARRIAGE DRIVE MECHANISM

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Oct. 26, 1982, Ser. No. 436,834
Int. Cl.³ B41L *13/16, 13/02*
U.S. Cl. 101—123 **9 Claims**



2. In a screen printing press, the combination of:

a stationary frame,

a pivoted printing head supported by the frame,

a screen supported beneath the printing head,

a carriage supported by the printing head and movable through a printing stroke along the length of the printing head,

the carriage including a squeegee which travels relative to the screen in contact therewith as the carriage travels through the printing stroke,

a motor-driven crankshaft comprising a rotating shaft with a crank extending radially outwardly therefrom and fixed thereto,

linkage means operatively associating the crankshaft with the carriage comprising a chain drive, a lever pivotally attached at one end to the frame and connected at an opposite end to the chain drive and having a movable connector member, and a link attached at one end to the crank and attached at the other end of the movable connector member, and

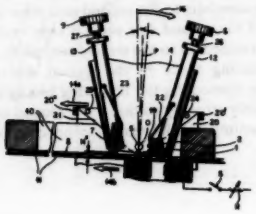
stroke adjustment means including an exterior operator located on the exterior of the printing press and operatively connected to said link means for moving the connector member longitudinally on the lever to alter the length of the stroke without interrupting operation of the press.

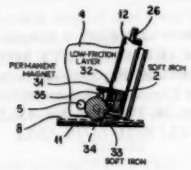
4,524,688

WIPER ASSEMBLY FOR FLAT-SCREEN PRINTER

Josef Glantschnig, Wölfnitz, Austria, assignor to Johannes Zimmer, Klagenfurt, Austria

Filed May 23, 1984, Ser. No. 613,594
Claims priority, application Austria, May 24, 1983, 1882/83
Int. Cl.[3] B41L *13/18, 27/00*
U.S. Cl. 101—123 8 Claims





1. An apparatus for printing a pattern on a horizontal substrate, comprising:

a horizontal frame above the substrate to be printed;

a flat screen with a pattern of dyestuff-permeable perforations spanning said frame;

a carriage movable relatively to said frame along a horizontal path at a lower level, relative to said screen during a printing phase, in one direction and at a higher level, during a non-printing phase, in the opposite direction;

support means on said carriage swingable between an operating printing position and an alternate scraping position about a horizontal pivotal axis transverse to said path;

an at least partly magnetizable first mass carried by said support means on one side of said pivotal axis, said first mass including a working wiper extending across said frame above said screen;

a nonmagnetizable second mass heavier than said first mass carried by said support means on an opposite side of said pivotal axis, said second mass including a distributing wiper extending across said frame above said screen;

electromagnetic means disposed directly below said first mass below said screen and a substrate overlain thereby, said electromagnetic means being movable concurrently and codirectionally with said carriage relatively to said frame; and

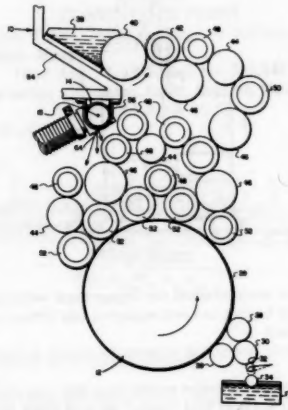
switch means for energizing said electromagnetic means during motion in said one direction, with resulting attraction of said working wiper onto said screen for pressing dyestuff accumulated thereon through said perforations onto the underlying substrate in the operating position of said support means, and de-energizing said electromagnetic means during motion in said opposite direction for enabling a swinging of said support means, acting on said nonmagnetizable second mass, by gravity into said alternate position in which said distributing wiper spreads residual dyestuff over the screen surface, said frame being vertically movable jointly with said carriage between a lower level and a higher level for keeping said screen spaced from the substrate during motion in said opposite direction.

4,524,689

DEHYDRATION APPARATUS FOR PRINTING PRESS INKING SYSTEM

Milton R. Lemaster, 16528 Voss Rd., Dallas, Tex. 75252

Continuation of Ser. No. 416,903, Sep. 13, 1982, abandoned. This application May 22, 1984, Ser. No. 613,743
Int. Cl.[3] B41L *23/20, 17/24*
U.S. Cl. 101—141 3 Claims



3. Apparatus for mounting on a lithographic printing press for reducing the water dilution of ink on the inking rollers of said press wherein said water dilution is caused by the mixing of water used for moistening the printing surface of said press with ink on said inking rollers, said press including a frame and a rotating plate cylinder mounted on said frame, and said inking system including a plurality of inking rollers engaged with said plate cylinder and arranged in series relationship to each other around a portion of the circumferential surface of said plate cylinder in the direction of rotation of said plate cylinder, said apparatus comprising:

an elongated conduit having an opening at one end for receiving a supply of low pressure air, said conduit being closed at the opposite end;

a plurality of elongated slot shaped orifices spaced apart along said conduit and aligned with each other in such a way as to direct a uniform curtainlike flowstream of pressure air toward said inking rollers;

one of said orifices being adjacent said one end of said conduit and being longer than the other of said orifices to provide for equal distribution of flow of air from said conduit with respect to the longitudinal axis thereof and toward said inking rollers;

support means for supporting said conduit on said press, said support means being operable to support said conduit in a preselected position of said conduit so that said orifices are operable to direct a uniform curtainlike flowstream of pressure air toward the last of said inking rollers in contact with said plate cylinder in the direction of rotation of said plate cylinder;

pressure air conducting means connected to said one end of said conduit; and

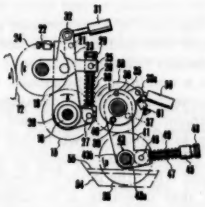
pressure air blower means connected to said pressure air conducting means for supplying pressure air to said conduit to produce said flowstream of pressure air to dehydrate ink on said last inking roller.

4,524,690

WATER SUPPLY APPARATUS FOR PRINTING PRESS

Tamotsu Omori, Toride City, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 292,388, Aug. 13, 1981, abandoned.
This application Sep. 7, 1983, Ser. No. 529,924
Claims priority, application Japan, Aug. 14, 1980, 55-110992; Jan. 22, 1981, 56-8404; Jan. 22, 1981, 56-8407
Int. Cl.[3] B41F *7/40;* B41L *25/16*
U.S. Cl. 101—148 20 Claims



1. A water supply apparatus for a printing press comprising:

a water supply roller being rotatably in contact with a plate cylinder of said printing press and being positioned remote from an inking roller for said plate cylinder;

a transfer roller in contact with said water supply roller and rotatable at the same peripheral speed as said plate cylinder;

an adjusting roller rotatably in contact with said transfer roller, said adjusting and transfer rollers each having a periphery moving in opposite directions at said contact;

a water feed roller being rotatably in contact with said adjusting roller, said water feed roller being immersed in a body of water in a water container;

means for causing said water supply roller to move into and out of contact with both of said transfer roller and said plate cylinder; and

means for adjusting contact pressure between said water supply roller and said transfer roller wherein said means for adjusting contact pressure comprises a shift lever rotatably mounted on a bearing supporting said transfer roller, an inverted T-shaped lever having a vertical leg and a horizontal leg pivotally connected to said shift lever, said water supply roller being supported by one end of said horizontal leg, compression spring means interposed between the other end of said horizontal leg and said shift lever, and motive means for swinging said inverted T-shaped lever.

4,524,691

ENVELOPE FEEDER FOR PRINTING PRESS WITH TIMING CIRCUIT FOR SUCTION CUPS, FEED ROLLER AND FLYWHEEL

Curtis B. Miller, Plantation, Fla., assignor to Graphic Arts Technical Innovators, Inc., Palm Bay, Fla.

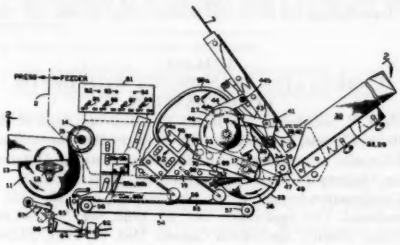
Filed Jan. 11, 1984, Ser. No. 570,004
Int. Cl.[3] B41F *13/24*
U.S. Cl. 101—232 21 Claims

21. An envelope feeder for a printing press having gearwheels in the printer interconnected with a gearwheel in the feeder, the feeder which comprises:

at least two feeder trays for holding envelopes to be printed, said feeder trays having an upper end for feeding envelopes into said feeder trays and a lower end for removing envelopes for printing from said feeder trays,

suction cup means coordinated with said feeder trays and movable in timed relationship with said printing press in an oscillatory motion between a rear position for engagement with envelopes to be removed by said suction cup means from said lower end of said feeder trays and a forward position for delivery of said envelopes from said forward position to

feed roller means, operating in timed relationship with said suction cup means to engage said envelopes, when said suction cup means is in said forward position, and to grab said envelopes in a pinching operation between said feed roller means and



a flywheel, said flywheel cooperating in timed relationship with said feed roller means to transport said envelopes to the feeding entrance of said printing press,

timing means for timing operation of said suction cup means, said feed roller means and said flywheel in timed relationship with said printing press,

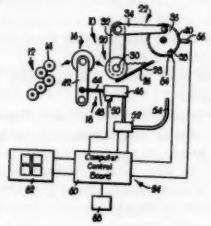
means for providing suction, and means for providing operating power for said envelope feeder.

4,524,692

ELECTRONIC INK FLOW CONTROL FOR PRINTING

Ronnie L. Rodvelt, Emporia, Kans., assignor to Didde Graphic Systems Corporation, Emporia, Kans.

Filed Apr. 18, 1984, Ser. No. 601,490
Int. Cl.[3] B41F *31/14;* B41L *27/16, 27/38*
U.S. Cl. 101—350 17 Claims



1. A method of controlling the amount of ink transferred to an ink train in a printing press, wherein the printing press includes a fountain roller in operable contact with an ink supply and a ductor roller shiftable between an ink train contact position and a fountain roller contact portion, said method comprising the steps of:

providing a control processor;

inputting an operating instruction into said processor indicative of the desired amount of ink transfer;

shifting the ductor roller into contact with the fountain roller;

rotating the fountain roller thereby transferring ink to the ductor roller during the interval contact is established therebetween and the fountain roller is rotated;

determining the amount of rotational movement of the fountain roller during said interval and transmitting the same as a rotation signal to the control processor,

said processor being operable when a programmed relationship exists between said rotation signal and said operating

instruction to initiate a disconnect of the ductor roller from contact with the fountain roller;

initiating disconnect of the ductor roller from contact with the fountain roller when said processor determines that said programmed relationship exists, thereby controlling the amount of ink transferred from the fountain roller to the ductor roller; and

shifting said ductor roller into contact with said ink train for transferring ink from said ductor roller to said ink train.

4,524,693

UNDERWATER TRANSDUCER WITH DEPTH COMPENSATION

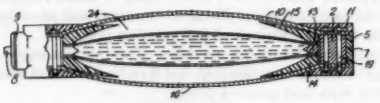
Garfield W. McMahon, and Bruce A. Armstrong, both of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Continuation-in-part of Ser. No. 392,470, Jun. 28, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 545,867

Claims priority, application Canada, Dec. 22, 1981, 392962

Int. Cl.³ H04B *17/00*

U.S. Cl. 367—167 **15 Claims**



1. A sealed underwater transducer comprising:

a plurality of electrostrictive elements and spacer elements arranged to form a driving ring, said elements having opposed surfaces axially of the ring, said ring surrounding a space radially internally of the same, said driving ring being expandable radially in response to an applied voltage;

a pair of flexible diaphragms closing off said space axially of said ring, said diaphragms each being formed with a plurality of extensions extending radially outwardly, said extensions being connected to said opposed surfaces of the elements so as to prevent mechanical bending stresses peripherally of the diaphragms from being transferred to the electrostrictive elements;

a closeable gas inlet means for injecting a compressed gas into said space;

a water bladder assembly within said driving ring, including a water bladder in said space, said water bladder having water inlet means in communication with the exterior of the transducer, said water bladder being collapsable by injection of a compressed gas at a predetermined pressure into said space via said gas inlet means, said water bladder being expandable from said collapsed condition to a condition substantially filling said space thereby to protect the diaphragms against collapse under excessive ambient water pressures; and

a pair of supports positioned in said space between said bladder and said diaphragms such that at a predetermined operating depth, when the external water pressure exceeds the internal gas pressure the bladder expands and is supported by said supports such that said water bladder is prevented from touching the diaphragms thus impeding the operation of said transducer, and hence extending the operating depth range.

2. A sealed underwater transducer comprising:

a plurality of electrostrictive elements and spacer elements arranged to form a driving ring, said elements having opposed surfaces axially of the ring, said ring surrounding a space radially internally of the same, said driving ring being expandable radially in response to an applied voltage;

a pair of flexible diaphragms closing off said space axially of said ring, said diaphragms each being formed with a plurality of extensions extending radially outwardly, said extensions being connected to said opposed surfaces of the elements so as to prevent mechanical bending stresses peripherally of the diaphragm from being transferred to the electrostrictive elements;

a closeable gas inlet means for injecting a compressed gas into said space; and

a water bladder assembly attached within said driving ring in a manner in which the assembly is mechanically decoupled from said driving ring, including a water bladder expandable to the shape of a torus, said water bladder having water inlet means in communication with the exterior of the transducer, said water bladder being collapsable by injection of a compressed gas at a predetermined pressure into said space via said gas inlet means, said water bladder being expandable from said collapsed condition to a condition substantially filling said space thereby to protect the diaphragms against collapse under excessive ambient water pressures, and a pair of supports positioned in said space between said bladder and said diaphragms, said supports substantially enclosing the torus shaped bladder when the latter is substantially filled with water, such that down to a predetermined operating depth, when the outside water pressure exceeds the internal gas pressure the bladder expands and is supported by said supports to prevent said water bladder from touching the diaphragms thus impeding the operation of said transducer, and hence extending the operating depth range.

4,524,694

CLUSTER BOMB PROJECTILE

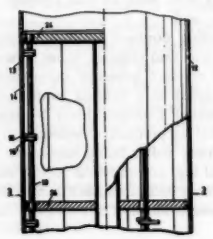
Dieter Boeder, Duesseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,076

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142313

Int. Cl.³ F42B *13/50, 25/16*

U.S. Cl. 102—393 **10 Claims**



1. An improved cluster bomb projectile for transporting a plurality of useful loads having a cylindrically shaped housing, said loads being adapted to be expelled from said housing at a predetermined point of the flight path of the projectile, the improvement comprising in combination:

said cylindrically shaped housing being formed by a plurality of detachable segments which jointly form a cylindrical housing surface;

each two adjoining segments have a pair of adjoining longitudinally extending side edges and each segment has an inner suface, a plurality of hook-shaped members projecting from the inner surface of each segment at an adjoining side edge interiorly of the housing and past the longitudinally extending side edge of the next adjoining segment, said longitudinally extending side edges of adjoining segments abutting against each other, each pair of hook-shaped members of adjoining segments being disposed one immediately above the other and defining an opening therebetween, said openings defined by pairs of hook-shaped members along confronting side edges of adjoining segments being axially aligned with respect to each other;

a rod is provided for connecting each pair of adjoining segments, which rod extends through all of said aligned openings defined by pairs of hook-shaped members along confronting side edges parallel to the longitudinal axis of the cluster bomb projectile;

said rod being essentially cylindrical in shape and including at least one projection in the region of each pair of hook-shaped members, which projection biasingly abuts against at least one hook-shaped member such that when said rod is moved in a predetermined manner relative to said adjoining segments the pair of adjoining segments are prestressed; and

each rod is axially slidably mounted in said aligned openings of said pairs of hook-shaped members.

4,524,695

FINNED SUBCALIBER PROJECTILE

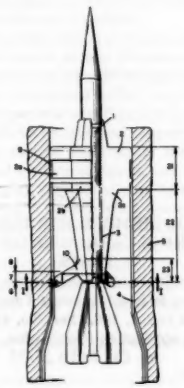
Bernhard Bisping, Ratingen-Hösel; Klaus Gersbach, Willich; Hans Luther, Kaarst; Walter Simon, Aachen; Peter Wallow, Dusseldorf, all of Fed. Rep. of Germany; Patrick Montier; Pierre A. Moreau, both of Bourges, France, and Jean C. Sauvestre, Saint-Doulchard, France, assignors to Etat Francais, Paris Armees, France

Continuation of Ser. No. 300,107, Sep. 8, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 654,528

Claims priority, application France, Sep. 23, 1980, 80 20381

Int. Cl.[3] **F42B** *5/02*

U.S. Cl. 102—430 **18 Claims**



1. Ammunition to be launched from a barrel of a weapon comprising:

a finned subcaliber-sized projectile;

a combustible tubular case surrounding a rear part of said projectile and containing a propulsive charge;

at least two longitudinal shell portions together comprising a launching shoe for launching movement with said projectile along a barrel of a weapon, said shoe being partially disposed within said tubular case and having an inner portion in form locking engagement with said projectile to prevent axial shifting between said shoe and said projectile while said shoe and said projectile are within said barrel but allow radial separation of said longitudinal shell portions from said projectile upon exit of said shoe and said projectile from said barrel;

said shoe comprising a tubular middle portion extending between a front portion and a rear portion of said shoe;

said front portion being disposed forward of said tubular case and being caliber-sized to create a seal between a combustion chamber and a front part of said barrel of said weapon;

said rear portion having recesses to permit passage of propulsive gases toward said front portion and having above caliber-sized projections extending through holes in said tubular case to frictionally engage a forcing cone of said barrel, the frictional engagement between said projections and said forcing cone being such as to limit movement of said shoe during launch until said propulsive gases reach a forcing pressure.

7. Ammunition to be launched from a barrel of a weapon comprising:

a finned subcaliber-sized projectile;

a non combustible tubular case surrounding a rear part of said projectile and containing a propulsive charge;

at least two longitudinal shell portions together comprising a launching shoe for launching movement with said projectile along a barrel of a weapon, said shoe being partially disposed within said tubular case and having an inner portion in form locking engagement with said projectile to prevent axial shifting between said shoe and said projectile while said shoe and said projectile are within said barrel but allow radial separation of said longitudinal shell portions from said projectile upon exit of said shoe and said projectile from said barrel;

said shoe comprising a tubular middle portion extending between a front portion and a rear portion of said shoe;

said front portion being disposed forward of said tubular case and being caliber-sized to create a seal between a combustion chamber and a front part of said barrel of said weapon;

said rear portion having recesses to permit passage of gases toward said front portion and having above caliber-sized projections to frictionally engage a forcing cone of an internal surface of said tubular case, the frictional engagement between said projections and said forcing cone being such as to limit movement of said shoe during lauch until said propulsive gases reach a forcing pressure.

13. Ammunition to be launched from a barrel of a weapon comprising:

a finned subcaliber-sized projectile;

a non-combustible tubular case surrounding a rear part of said projectile and containing a propulsive charge;

at least two longitudinal shell portions together comprising a launching shoe for launching movement with said projectile along a barrel of a weapon, said shoe being partially disposed within said tubular case and having an inner portion in form locking engagement with said projectile to prevent axial shifting between said shoe and said projectile while said shoe and said projectile are within said barrel but allow radial separation of said longitudinal shell portions from said projectile upon exit of said shoe and said projectile from said barrel of said weapon;

said shoe comprising a tubular middle portion extending between a front portion and a rear portion of said shoe;

said front portion being disposed forward of said tubular case and being caliber-sized to create a seal between a combustion chamber and a front part of said barrel of said weapon;

said rear portion having recesses to permit passage of propulsive gases toward said front portion and having projections extending at least partially through hole in said tubular case to limit movement of said shoe during launch until said propulsive gases reach a forcing pressure, said projections shearing at an inner surface of said tubular case to allow movement of said shoe when said propulsive gases reach said forcing pressure.

4,524,696

EXPLOSIVE SHRAPNEL SHELL

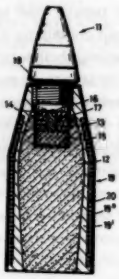
Ernst-Wilhelm Altenau, Duisburg; Ulf Hahn, Hösel, and Udo Sabranski, Willich, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 5, 1983, Ser. No. 510,930

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224704

Int. Cl.³ F42B *13/18*

U.S. Cl. 102—491 **7 Claims**



1. An improved shrapnel shell having an interior wall, an ignition fuse, and an outer shrapnel multilayer which layer laterally surrounds a bursting charge, the improvement comprising

(a) said ignition fuse forming the nose of the shell and having a cylindrical rearwardly axially extending portion having an outer cylindrical wall containing second shrapnel which portion defines a first annular space between its outer cylindrical wall and the interior wall of the shell;

(b) said bursting charge disposed in said shell and extending into said first annular space;

(c) a coaxial detonating charge extending through at least a portion of said cylindrical portion defining a second annular space containing the second shrapnel; and

(d) an intensifying charge mounted in said cylindrical portion and having a higher specific energy that said bursting charge and being disposed behind said tube and said second shrapnel and extending across the entire cross-section of said cylindrical portion.

4,524,697

PROJECTILE ARRANGEMENT FOR A WEAPON HAVING A GUN BARREL

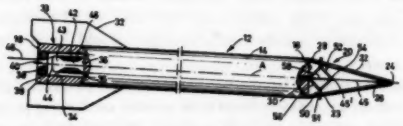
Jürgen Böcker, Oberhausen; Klaus Gersbach, Willich; Karl W. Bethmann, Moers, and Gerhard Glotz, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,671

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127002

Int. Cl.³ F42B *11/00*

U.S. Cl. 102—517 **1 Claim**



1. An improved projectile arrangement for a barrel weapon having a plurality of subcaliber projectiles which are jointly mounted on a common sabot having a plurality of segments, the improvement comprising an arrangement for attaining a sequential flight of a leading projectile and a plurality of sequentially following projectiles in the same flight path after their separation from the sabot segments of the common sabot, wherein the arrangement includes wires which join the following projectiles to each other and to the leading projectile for maintaining a predetermined distance from each other along a common flight path, each following projectile having a wire connection at its nose;

an elastic tension absorbing device is interposed in the wire within the first following and second following projectiles;

wherein the projectiles exhibit, at least at firing, the following features:

(a) different air resistance values a_1, a_2, a_3; whereby air resistance a_1 corresponds to the air resistance of the leading projectile, air resistance a_2 corresponds to the air resistance of the first following projectile and air resistance a_3 corresponds to the air resistance of the second following projectile;

(b) $a_1 > a_2 > a_3$;

wherein each following projectile has at least two operatively connected retractable air foils, at least one projectile being provided with automatic means for retracting the air foils to vary the air resistance of said projectile, said automatic control means being adapted to be activated by means of a predetermined prevailing axial tensional force exerted thereon by the wire.

4,524,698

MODULAR RAIL MEMBER FOR THE TRANSLATION OF LOAD-BEARING CARRIAGES ON AN OVERHEAD TRACK

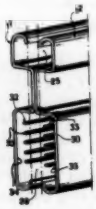
Jean-Louis Tourtellier, and Roger Schoen, both of Mulhouse, France, assignors to Etablissements Tourtellier S.A., France

Filed Sep. 2, 1982, Ser. No. 414,078

Claims priority, application France, Jun. 15, 1982, 82 10563

Int. Cl.³ E01B *25/22*

U.S. Cl. 104—107 **5 Claims**



1. A modular rail member for the translation of load-bearing carriages on an overhead track, in particular a suspended, tubular monorail, said modular rail member comprising a vertical wall formed with two sections of different lengths which are spaced apart from and connected to each other by a flare having a vertical web, characterized in that said two spaced apart sections have ends curved toward the same direction, and vertical plane passing through the horizontal outer edges of said curved ends being set closer to the plane of the web than to the plane connecting the two vertical sections.

4,524,699

LOW LEVEL FREIGHT CAR FOR CARRYING TRAILERS

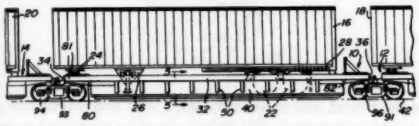
Michael J. Pavlick, Norristown, Pa., assignor to The Budd Company, Troy, Mich.

Continuation of Ser. No. 434,294, Oct. 14, 1982, Pat. No. 4,456,413, which is a continuation of Ser. No. 147,965, May 8, 1980, abandoned. This application Jun. 21, 1984, Ser. No. 623,269

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.³ B61D *3/10, 15/00*

U.S. Cl. 105—4 R **1 Claim**



1. A low level freight car for carrying a trailer comparable in length to the length of said freight car and having trucks including wheels supporting each end of said car and at least one next adjacent freight car comprising:

(a) a main frame including a pair of load supporting longitudinal top side beams and end channels;

(b) side and end walls connected to said side beams and said end channels, respectively, extending downwardly therefrom and forming stress panels for transfering loads to said side beams and said end channels;

(c) a plurality of spaced, tapered braces extending substantially along the length of said freight car connected between said longitudinal top side beams and said side walls;

(d) a floor structure connected to the low portion of said side and end walls to provide a well area below said side beams and end channels to receive and support the bottom portion of a trailer therein and transfer the vertical load to said side and end wall stress panels, said floor structure of said well area being substantially in the same plane as the horizontal centerline of said truck wheels;

(e) said floor structure including a plurality of spaced lateral cross beams connected between the bottom portions of said downwardly extending walls;

(f) end frame assemblies secured to each end at said freight car adjacent said well area including coupling means secured thereto;

(g) a pair of trucks for supporting each of said freight car; and

(h) coupling means connected to said end frame assemblies being adapted to pivotally secure the respective end of said freight car on one of said trucks, and at least one of said trucks being adapted for pivotally supporting another freight car.

4,524,700

OPENING COVER FOR RAILROAD CARS

Roger Engdahl, St. Paul, Minn., assignor to Proform, Inc., Minneapolis, Minn.

Filed Jun. 7, 1982, Ser. No. 385,944

Int. Cl.³ B61D *39/00*

U.S. Cl. 105—377 **7 Claims**

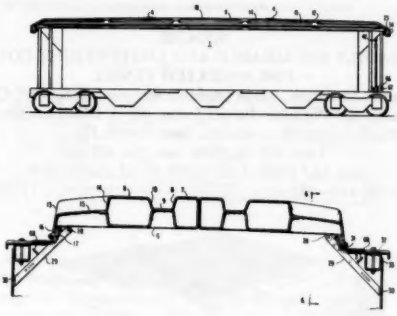
1. An opening car cover for railroad cars, the walls of said cars defining an upwardly open space, said cover, when closed, extending completely across said opening, comprising:

a cover member further comprising first and second halves;

a drive means affixed to said halves and capable of causing said halves to undergo translational movement;

each said half further comprising an upper surface of alternate raised and lowered portions of a notched shape in cross-section, said alternate raised and lowered portions extending the length of said cover, said upper surface defining dome-shaped envelope in longitudinal cross-section, and a flat lower surface integrally attached to said upper surface and spaced therefrom by integral lateral and longitudinal end portions extending downwardly from said upper surface to said lower surface which said lower surface is supported on the wall of the railroad car through friction reducing means on which it rests;

said cover member being comprised substantially of fiberglass products;



wherein said friction reducing means comprises wheels affixed to said cover halves which engage a track affixed to the lateral ends of said railroad car, and a plurality of rollers supported by braces affixed to the interior of the longitudinal walls of said railroad car, said rollers engaging said lower surface of said car cover halves.

4,524,701

DETACHABLE CAR SEAT TABLES

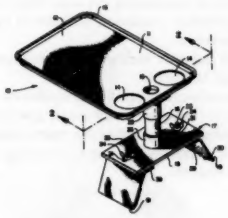
Austin W. Chappell, 739 E. First South, Kaysville, Utah 84037

Filed Aug. 27, 1982, Ser. No. 412,173

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ A47B *23/00, 37/00*

U.S. Cl. 108—44 **9 Claims**



1. A car seat table assembly comprising:

(a) a lower attachment section consisting of a generally rectangular, horizontal base plate having attached thereto a pair of opposing laterally adjustable sidewings, each sidewing having outer and inner surfaces, a forward base plate engaging section and a rearward carpet engaging section, the inner surface of each carpet engaging section containing a multiplicity of projecting pointed teeth which teeth are slanted back at an angle in the direction of the forward base plate engaging section, said base plate containing on the upper surface thereof upwardly extending tubular support means for telescopically receiving a vertical support member,

(b) a generally rectangular tray section having a horizontal floor surrounded by an upwardly extending rim, the forward portion of said tray section containing a plurality of apertures for receiving and holding liquid food containers, the lower surface of the forward portion of said tray

section containing downwardly extending tubular support means for telescopically receiving a vertical support member, and

(c) a vertical support member adjustably and frictionally secured in said upwardly and downwardly extending tubular support means of said attachment and tray sections.

4,524,702

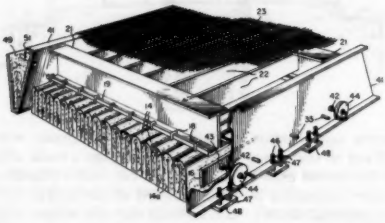
READILY REPAIRABLE AND LIGHTWEIGHT COVER FOR A HEATED VESSEL

Thomas M. Miller, North Olmsted; Raymond J. Schraff, Cleveland, and Nicholas Labas, Solon, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Jul. 30, 1984, Ser. No. 635,441

Int. Cl.³ E04B *1/80*; C04B *43/02*; F23M *7/00*

U.S. Cl. 110—173 A **11 Claims**



1. A lightweight insulation cover structure for retaining heat in a heated vessel, said cover structure having a ceramic fiber insulation hot face, which cover structure comprises:

a pair of opposing, outer frame members spaced sufficiently apart one from the other for positioning each member at opposite ends beyond the opening of said vessel;

a series of parallel cover support members spanning said vessel opening, spaced apart from each other and located transversely between said frame members as well as being affixed thereto;

a plurality of depending ceramic fiber insulation units, each in form-stable condition positioned under said cover support members;

insulation support means in interengagement with said depending insulation;

linking means connecting said insulation support means with said cover support members in upwardly moveable and at least substantially swinging engagement; and

adjustable compression means abutting against said depending insulation.

4,524,703

THREAD CHANGING MECHANISM FOR SEWING MACHINES

Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

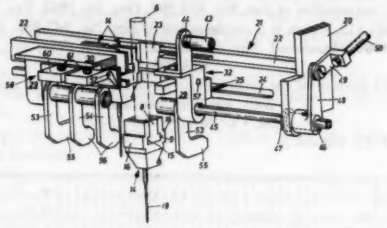
Filed Mar. 14, 1984, Ser. No. 589,497

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309608

Int. Cl.³ D05B *55/16*; D05C *3/02*

U.S. Cl. 112—098 **9 Claims**

1. In a sewing machine including a reciprocating needle bar for reciprocating a thread needle having thread fed thereto, the improvement comprising a needle holder magazine, a plurality of needle holders in said magazine, means mounting said holders in said magazine for movement across the path of movement of said needle bar for selectively aligning a selected one of said needle holders with the needle bar, said magazine having a holder receiving recess aligned with said needle bar, displacement means engageable with said holders to shift said holders relative to said needle bar so as to align a selected holder with the recess, and thread clamping means engageable with said holders for engaging against thread fed thereto to



hold the thread, and means associated with said thread clamping means to disengage said thread clamping means when said magazine is engaged with said needle bar.

4,524,704

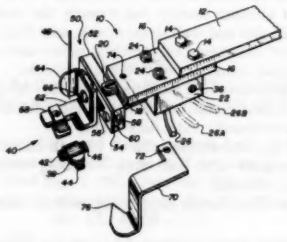
ACCESSORY-HOLDING JIG PROVIDING MULTIPLE SEWING POSITIONS

Salvatore V. Cusumano, Moscow, Pa., assignor to G & G Sewing Machine Co., Inc., Moscow, Pa.

Filed Apr. 20, 1983, Ser. No. 486,799

Int. Cl.³ D05B *3/18*

U.S. Cl. 112—105 **7 Claims**



1. A jig for a sewing machine, in combination with a clothing fastening accessory having at least two thread holes, wherein said jig supports said accessory while being stitched to a workpiece comprising:

attachment means attachable to the sewing machine in predetermined relationship with respect to the needle of the sewing machine;

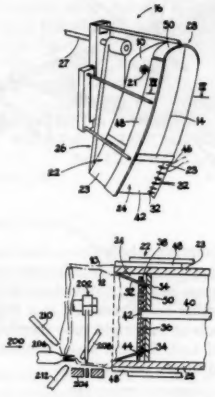
a first sliding means held in slidable relationship with the attachment means and including first location-determining means to impede the first sliding means in at least two predetermined positions, said two positions being separated by the same distance in one direction as two thread holes on said accessory wherein said distance is substantially parallel to the sewing machine needle plate and substantially perpendicular to the direction of workpiece travel when said accessory is being stitched thereto;

an accessory-holding means attached to and extending from the first sliding means to a location below the needle of the sewing machine, permitting the alignment of the at least two thread holes on the accessory with the needle of the sewing machine when the first slidable means is in its predetermined positions.

4,524,705
SPADE GUSSET SEAMING APPARATUS

John C. Humphreys, Hinckley, England, assignor to H. Flude & Company (Hinckley) Limited, Leicestershire, England

Filed Mar. 17, 1982, Ser. No. 359,093
Claims priority, application United Kingdom, Mar. 18, 1981, 8108526
Int. Cl.³ D05B 21/00
U.S. Cl. 112—121.15 11 Claims



1. Apparatus for automatically seaming a spade gusset to a garment comprising a carrier for supporting the garment about a seam thereof; and means for opening the garment along said seam, said carrier comprising an elongate member having a substantially gusset-shaped opening for receiving the gusset, means operable to adjust the profile of an opened seam, and inner support means mounted internally of said member and displaceable relative to said member for gripping the gusset so as to enable the opening in the garment and the gusset periphery to be brought into overlapping relationship; a gusset mounting station comprising means for mounting said gusset and presenting said gusset to said inner support means; a sewing station comprising a seaming machine for seaming the gusset and the garment together, said carrier being displaceable relative to said machine to bring the machine into engagement with the garment and gusset to enable the gusset to be seamed to the garment by a single continuous seam.

11. An apparatus for automatically applying a spade gusset to a garment comprising a carousel unit having at least one carrier for supporting the garment in a predetermined position thereon, the carrier being supported for movement about a substantially vertical axis of the unit successively through a cutting station for providing on opening in said garment for receiving the gusset, a gusset mounting station for presenting the gusset to the garment opening and a sewing station for seaming the gusset into the garment opening; and wherein the carrier comprises an elongate member having a substantially gusset-shaped area for receiving the gusset and inner support means displaceable relative to said member for gripping the gusset so as to enable the garment opening edges and the gusset periphery to be brought into overlapping relationship.

4,524,706
TRIM ATTACHING MACHINE AND METHOD

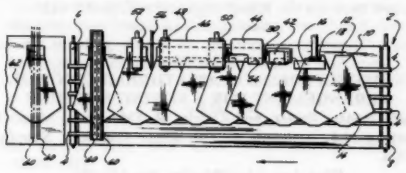
James D. Bell, Campbellsville, Ky., assignor to Union Underwear Company, Inc., Bowling Green, Ky.

Filed Sep. 25, 1981, Ser. No. 305,402
Int. Cl.³ D05B 19/00
U.S. Cl. 112—121.29 14 Claims

1. A machine for successively attaching fabric trim to a plurality of cut pieces of fabric at an edge of each cut piece, the cut pieces being spaced apart from each other such that said edges of adjacent cut pieces are non-overlapping with said adjacent cut pieces, comprising:

means for successively transporting a plurality of cut pieces to a sewing location;

means for feeding a continuous band of fabric trim to the sewing location in such a manner that the band meets the cut pieces in succession and overlaps said edges;



means for successively sewing the band to the cut pieces at the sewing location;

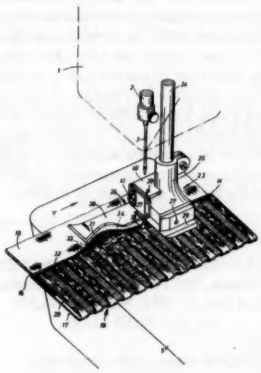
means for increasing the distance between adjacent cut pieces; and

means for cutting the band intermediate adjacent cut pieces, after the distance between them is increased, thereby separating said cut pieces.

4,524,707
DEVICE FOR FEEDING AND SEWING A TRIMMING RIBBON TO A GARMENT PART

Wilfried Sander, Nurtingen, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,367
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309607
Int. Cl.³ D05B 35/04
U.S. Cl. 112—152 6 Claims



1. A device for feeding and sewing a U-shaped trimming ribbon which has an upper portion overlapped upon the edge of a garment which is fed over a needle plate and with a ribbon lower portion underlying a margin of the garment forming with the garment a workpiece using a sewing machine having a reciprocating needle movable in a stitch forming area to effect a seam cooperating with a movable presser foot which is engageable with the workpiece to sew the ribbon to the garment along the seam, comprising an angle shaped guideway defined on the needle plate overlying and securing the position of the edge of the lower portion of the ribbon, a guide web carried by the presser foot extending parallel to the seam and

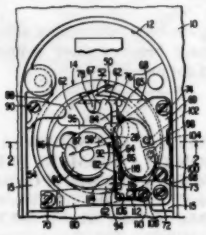
overlying the garment for securing the position of the upper portion of ribbon, a guide bar connected to and spaced laterally of said guide web and including a vertically extending portion extending parallel to the seam and providing a lifting edge located before the stitch forming area over which the upper portion of the ribbon is moved, and a hold-down edge over which the upper portion of the ribbon is moved which is located before the stitch forming area, and a hold-down carried by the presser foot and engageable with the ribbon adjacent its folded edge directly adjacent the needle stitch forming area and between the lifting edge and said guide web.

4,524,708

NOISE SUPPRESSION AND THREAD CONTROL ARRANGEMENT FOR A SEWING MACHINE

Donald Rodda, Butler, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 13, 1984, Ser. No. 639,660
Int. Cl.³ D05B *57/08*
U.S. Cl. 112—231 **5 Claims**



1. In a sewing machine, a bed, a looptaker mounted for rotation about a vertical axis in the bed and including a beak for seizing a loop of needle thread during looptaker rotation in a defined direction, a bobbin case loosely confined within the looptaker, a light force applying resilient member in continuous biasing engagement with the bobbin case for urging one side of the bobbin case against the looptaker and said bobbin case rotationally about the looptaker axis in a direction opposite to said defined direction of rotation of the looptaker for engagement with a stop having a fixed position in the bed, and a resilient shock absorber spaced a predetermined distance from the bobbin case in a position adjacent the bobbin case for engagement thereby only upon movement of the bobbin case in opposition to the bias of said resilient member.

4,524,709

COLLAPSIBLE WIND PROPELLED WATER CRAFT

Quentin M. McKenna, 524 Portlock Rd., Honolulu, Hi. 96825

Filed Dec. 3, 1982, Ser. No. 446,595
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—39 **36 Claims**

1. A wind propelled water craft comprising:

three spaced apart support members adapted to engage and be supported on the surface of the water,

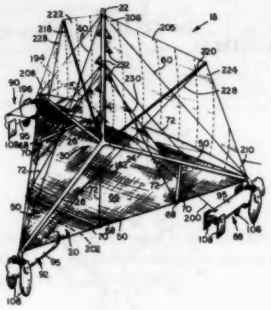
a substantially tetrahedral frame comprising four substantially rigid spars connected together at a juncture and extending radially outwardly therefrom, said spars having ends distal from said juncture, and a first plurality of taut, flexible stays connected to and between each one of said spars and the other said spars, respectively, said stays being connected to said spars at points near the distal ends thereof,

three of said spars extending laterally and downwardly from said juncture and the fourth one of said spars extending vertically upward from said juncture, said fourth spar lying along a vertical axis,

said support members being connected to said tetrahedral frame at points near said distal ends of said three spars,

a sail connected to said tetrahedral frame, and

a triangularly-shaped trampoline having its three vertices connected near said distal ends of said three spars, and



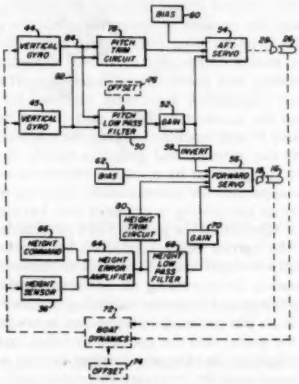
a tensioning means comprising three sleeve members, each said sleeve member being connected to said trampoline near a respective said vertex, and three rigid tube members, each said rigid tube member being received in a respective said sleeve member, each of said rigid tube members having a second plurality of taut, flexible stays connecting its end portions to the said fourth vertical spar.

4,524,710

AUTOMATIC TRIM SYSTEM FOR HYDROFOIL CRAFT

John H. Scott, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

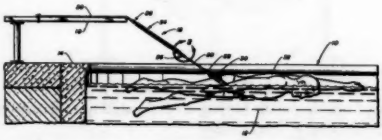
Filed Jan. 11, 1979, Ser. No. 2,412
Int. Cl.³ B63B *1/28*
U.S. Cl. 114—275 **1 Claim**



1. In a control system for a hydrofoil craft of the type in which a servo system for a control surface on a submerged foil is varied by an error signal derived by comparison of a reference signal with an actual position signal, and wherein said control system is subject to an offset from theoretical control parameters due to manufacturing tolerances of parts and wear, and wherein a bias signal is supplied to compensate for said offset, the combination of means for automatically establishing said bias signal including: means for comparing a hydrofoil craft responsive signal with a reference signal to generate a comparison signal; means for integrating said comparison

signal between maximum and minimum values to generate an integrated signal, first amplifying means for amplifying said comparison signal before it is applied to said integrating means, second amplifying means for amplifying the output of said integrating means, summing means for summing the output of said second amplifying means with a control signal, an amplifier with negative gain adapted to apply a signal proportional to the output of said summing means to the input of said first amplifying means whereby, when said output is connected through said first amplifying means with negative gain to the input of said integrating means, the output of said summing means will rapidly drop to zero, and means for varying said bias signal as a function of the magnitude of said integrated signal.

4,524,711
SWIMMING HARNESS
David P. Ashrow, 1651 N. Foothill Rd., Ojai, Calif. 93023
Filed Jul. 11, 1983, Ser. No. 512,665
Int. Cl.³ F16G *11/00*
U.S. Cl. 114—215 **2 Claims**

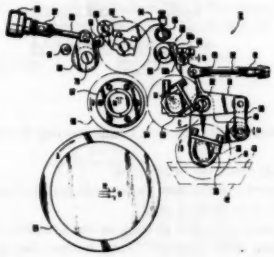


1. A swimming harness for holding a swimmer in a selected location in a swimming pool yet giving the swimmer freedom of swimming movement, said swimming harness comprising:

an elongated integral member having an inner end and an outer end, said elongated member being tubular defining an internal chamber, said elongated member comprising a cord, said elongated member including resilient means to permit a limited amount of stretching said elongated member, said resilient means comprising a mass of knots formed within said cord as well as the partial collapsing of said internal chamber during stretching of said cord, said mass of knots comprise a plurality of overlapping knots which are loosely knotted, said inner end adapted to be attached to an exterior fixed object; and

a belt adapted to be located about the waist of the swimmer, said belt being attached to said outer end.

4,524,712
VARNISH COATER FOR PRINTED PRODUCT
Kiyoshi Ito, Chiba, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1984, Ser. No. 576,219
Claims priority, application Japan, Feb. 3, 1983, 58-16602
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—46 **5 Claims**



1. A varnish coater for coating varnish transferred from a form roller to a blanket cylinder on a printed sheet passing through the blanket cylinder and an impression cylinder, comprising:

first eccentric bearings for supporting said form roller;

rolling members mounted on outer end portions of said first eccentric bearings, respectively;

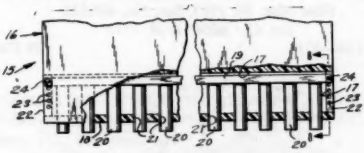
cams which are pivotally supported by second eccentric bearings, respectively, and each of which has a large diameter portion and a small diameter portion which are selectively brought into contact with a corresponding one of said rolling members;

first pivoting means for pivoting said cams;

biasing means for biasing said rolling members each of which is brought into tight contact with one of said large and small diameter portions of a corresponding one of said cams; and

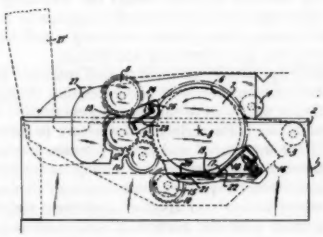
second pivoting means for pivoting said second eccentric bearings to shift an axis of a cam shaft of said cams.

4,524,713
WAX TOOL
Paul Debry, P.O. Box 1365, New Smyrna Beach, Fla. 32070-1365
Filed Apr. 18, 1984, Ser. No. 601,723
Int. Cl.³ B05C *11/02*
U.S. Cl. 118—102 **1 Claim**



1. A wax tool for scribing a pattern in a warmed wax, comprising, in combination, a flat body, a row of equally spaced-apart teeth projecting from one longitudinal edge of said main body, each said tooth being transversely round and having a flat end face at right angle to a longitudinal axis of said tooth, a longitudinal opening through said main body, a bar slidable in said opening, said teeth being affixed along said bar and extending through a plurality of holes of a wall of said main body having said longitudinal edge, and a pair of screw fasteners received through transverse openings in said bar and selected ones of a plurality of transverse openings in said main body for selective projecting distance of said teeth from said main body.

4,524,714
PASTING MACHINE FOR A WEB OF MATERIAL, PREFERABLY WALLPAPER
Paul Hohenhövel, Meinstr. 114, D-3180 Wolfsburg 11, Fed. Rep. of Germany
Filed Mar. 22, 1984, Ser. No. 592,215
Int. Cl.³ B05C *1/08*
U.S. Cl. 118—123 **9 Claims**



1. A pasting machine for a web of material (1), preferably wallpaper, having a paste well (16), a paste applicator roll (7) arranged in driveable manner over said well and contacted by the web of material (1) over a portion (6) of its circumference facing away from the paste well (16), the periphery of said applicator roll being uniformly coated with paste from the paste well (16), and having guide rolls (3, 4, 5) for the web of

material (1) arranged on both sides of the applicator roll (7) and pulling the web of material (1) against the upper periphery (6) of the applicator roll (7), characterized by the fact that a paste well roll (15) which extends parallel to the applicator roll (7) and is driven in the direction of rotation opposite to that of the applicator roll (7) extends at least over a part of its periphery into the paste (17) in the paste well (16) and that a paste guide plate (18) is provided which surrounds, at a distance, a circumferential region (19) of the applicator roll (7) which is adjacent the feed roll (15), said guide plate (18) being adapted to force paste against said circumferential region (19) and by means of a longitudinal edge (20) facing the periphery of the feed roll (15) takes up paste from the feed roll (15), and that below the part of the web of material (1), which has moved away from the applicator roll (7) and at a distance from said part of the web which determines the thickness of the layer of paste on it, a scraper bar (23) is arranged within the vertical projection of the paste well (16).

4,524,715

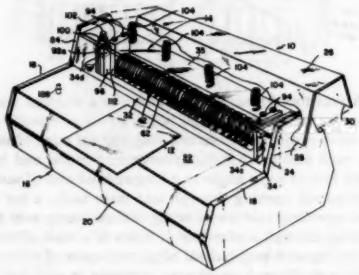
APPARATUS FOR APPLYING A COATING MATERIAL

William C. Abrams, 215 N. Avenue East, Cranford, N.J. 07016

Filed Mar. 30, 1983, Ser. No. 480,322

Int. Cl.³ B05C *1/08, 1/16*

U.S. Cl. 118—221 **39 Claims**



1. Apparatus for applying a coating material to a sheet material, said apparatus comprising:

housing means for providing a substantially enclosed interior, said housing means including reservoir means for containing a supply of coating material to be coated on a sheet material;

a rotatable applicator roll mounted in the interior of said housing means for receiving coating material from said reservoir means and for then applying said coating material to a sheet material;

said housing means being sealable to seal the interior thereof from exposure to the surrounding atmosphere, and including movable opening means for providing access for a sheet material to said rotatable applicator roll;

said housing means further including a wall having an aperture of a predetermined size therein;

a shaft operatively coupled to said rotatable applicator roll for rotation therewith and extending through said aperture in said wall of said housing means;

sealing means for sealing said aperture to prevent exposure of the interior of said housing means to the atmosphere through said aperture, said sealing means having an outer peripheral dimension which is greater than said predetermined size of said aperture and being disposed to be in contact with the portion of said wall surrounding said aperture to thereby create a seal between said aperture and said sealing means, and said sealing means having a cylindrical transverse bore therethrough for receipt of said shaft therethrough, the interior of said bore including an inner groove therein and said shaft including an outer groove therein disposed to be in alignment with said inner groove of said bore, and said sealing means further including ring sealing means having an inner portion disposed in said outer groove of said shaft and an outer portion disposed in said inner groove of said bore.

4,524,716

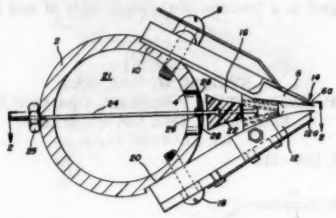
ADJUSTABLE AIR KNIFE

Hans J. Mueller, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Filed Jan. 18, 1984, Ser. No. 571,808

Int. Cl.³ B05C *11/06*

U.S. Cl. 118—665 **16 Claims**



1. An adjustable gas knife, comprising:

elongated nozzle means having an elongated nozzle opening for projecting a sheet of gas;

elongated flexible gas flow modification means located within said nozzle for modifying the rate of flow of said gas; and

differential adjusting means for selectively adjusting the position of said gas flow modification means relative to said nozzle opening at a plurality of positions along the length of said gas flow modification means to thereby selectively modify the rate of flow of said gas through said nozzle opening.

4,524,717

ELECTRON BEAM STRIP-COATING APPARATUS

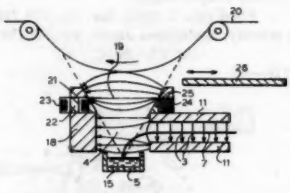
Manfred Neumann; Siegfried Schiller; Gerhard ZeiBig; Henry Morgner, and Günter Jüsch, all of Dresden, German Democratic Rep., assignors to Bakish Materials Corp., Englewood, N.J.

Filed Apr. 18, 1983, Ser. No. 485,650

Claims priority, application German Democratic Rep., Apr. 20, 1982, 239121

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **10 Claims**



1. Apparatus for the electron beam coating of strips comprising:

a horizontal electron beam gun;

a first magnetic deflection system adapted to fan the beam at an angle α from said gun;

an evaporation crucible as long as the breadth of the strip to be coated, said crucible lying below the plane of said fanned beam;

a second magnetic deflection system for creating a vertical sector field in the path of said beam and adapted to bend same into parallel rays at an approximately constant angle (α) as it emerges therefrom adjacent said crucible;

a third magnetic deflection system for creating a horizontal field over said crucible, and adapted to bend said beam downward into line contact with evaporant along the approximate centerline of said crucible, said third field also acting to deflect backscattered electrons;

means for transporting a strip of material to be coated above said crucible; and

vacuum chamber means enclosing said crucible, second and third deflection means and said transporting means.

4,524,718

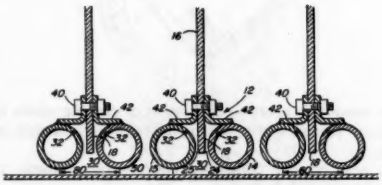
REACTOR FOR CONTINUOUS COATING OF GLASS

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 443,340, Nov. 22, 1982, abandoned. This application Aug. 10, 1983, Ser. No. 521,675

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **12 Claims**



1. A reactor suitable for use in continuous chemical vapor deposition coating formed by the reaction of a first reactant and a second reactant said apparatus having a coating station comprising

(a) a spaced pair of reactant-feed tubes mounted above a reaction zone, tranverse to the relative movements of the surface to be coated;

(b) a series of spaced apertures in each of said tubes to conduct reactants from each of said tubes of said pairs, said apertures forming primary means to distribute reactants flowing through said tube;

(c) shield means between said aperture tubes forming means to shield different reactants from one another and to deflect said reactants leaving said apertures (1) through a relatively narrow passage, formed of that reactant-feed tube from which said reactant is fed and said shield means and without prior contact with said surface (2) into a reaction zone at a point of about one inch or less above said surface to be coated.

4,524,719

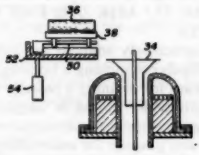
SUBSTRATE LOADING MEANS FOR A CHEMICAL VAPOR DEPOSITION APPARATUS

Bryant A. Campbell; Dale R. DuBois, both of Los Gatos; Ralph F. Manriquez, Saratoga, and Nicholas E. Miller, Cupertino, all of Calif., assignors to Anicon, Inc., San Jose, Calif.

Filed Sep. 6, 1983, Ser. No. 529,415

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—719 **11 Claims**



1. A controlled temperature deposition device comprising an inner deposition reaction chamber having gas distribution means for introducing gas into the inner chamber and removing gas therefrom, and vacuum chamber means surrounding the inner deposition reaction chamber and spaced from the walls thereof for maintaining a medium vacuum therein, the vacuum chamber means comprising a domed housing and a base cooperating therewith, the material of the domed housing and base being substantially transparent to radiation, said radiant heating means being positioned over outer surfaces of the domed housing and base surrounding the inner deposition chamber for providing precisely controlled temperatures in the reaction chamber, substrate loading means in combination with the device and positioned for placing a boat carrying a plurality of wafers in the inner deposition chamber and for removing the boat from the inner deposition chamber, the substrate loading means including a boat engaging means and a support for engaging the boat engaging means and for guiding the movement of the boat engaging means in a linear path between an extended position and a retracted position.

4,524,720

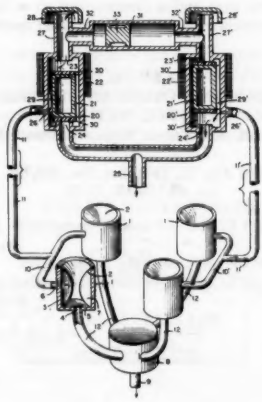
INDICATING DEVICE FOR MILKING APPARATUS

Eyal Brayer, Kfar Monash, Israel, assignor to 501 S.C.R. Engineers, Ltd., Nathania, Israel

Filed Jul. 18, 1983, Ser. No. 514,477

Int. Cl.³ A01J *5/14*

U.S. Cl. 119—14.14 **10 Claims**

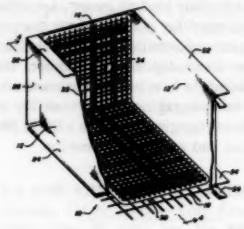


1. An indicating device for a milking apparatus, adapted to indicate regular or irregular working of each of the four teat cups attached to the udder of a cow, said apparatus comprising two electromagnetic pulsator units, each connected to two of said teat cups and adapted to expand and contract said teat cups by alternately admitting air of atmospheric pressure to, and drawing air by vacuum action out of, said teat cups, said indicating device consisting of a horizontally positioned cylinder containing a free piston and communicating at each end with one of the conduits leading from each pulsator unit to the atmosphere, said piston being driven to axially oscillate in said cylinder by the alternating suction pressure and atmospheric pressure in said conduits, whereby faulty operation of one of said conduits causes changes in the suction pressure in one of said conduits which is indicated by an unequal stroke of said piston to one side from a central position in said cylinder.

4,524,721
ANIMAL CAGE INSERT AND CONVERTIBLE ANIMAL CAGE

Michael Lanner, Stoughton, and Cynthia L. Coffey, Wayland, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Filed Mar. 5, 1984, Ser. No. 586,273
Int. Cl.³ A01K 31/06
U.S. Cl. 119—17 1 Claim

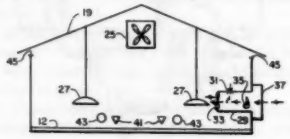


1. A process for converting a hanging animal cage suitable for use for caging a first animal species to a cage suitable for use as a cage for a second smaller animal species comprising (1) providing a cage having two solid sides and a solid back with an open grid bottom and open grid front wherein said grid size is dimensioned to safely and hygienically contain a first animal species and (2) inserting into the cage an L-shaped grid insert so as to cover the open grid bottom and open grid front, wherein said insert grid size is smaller than the size of the grids provided on the cage and is dimensioned so as to safely and hygienically contain a second smaller animal species.

4,524,722
LIVESTOCK ENCLOSURE ENVIRONMENTAL CONTROL METHOD

Frank J. Siccardi, 204 Warren Way, Apartment 20, Modesto, Calif. 95356

Filed Jan. 11, 1984, Ser. No. 569,796
Int. Cl.³ A01K 31/20
U.S. Cl. 119—21 19 Claims



1. A method of providing in an enclosure for livestock an environment favorable for the growth, quality, and survivability of livestock and unfavorable to propagation of microorganisms comprising the steps of

forcibly injecting air into said enclosure intermittently with an air jet device controlled to have a duty factor of from 0.04 to 0.4, an on-time of at least 30 seconds, and an off-time of less than 10 minutes,

adding heat to said air so that its temperature is between 50° F. and 70° F. in response to inside temperature sensing means,

controlling the effective area of egress for air from said enclosure, and

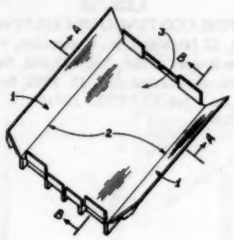
circulating the air in said enclosure with air movers directed away from the place of forcible air injection and located away from the place of forcible air injection and located at least four feet above the floor of said enclosure,

whereby injected air primarily escapes distant from the place of injection.

4,524,723
REMOVABLE POULTRY NEST BOTTOMS OF VARIABLE WIDTHS

Walter G. Davis, Hall County, Ga., assignor to NesTier Corporation, Cincinnati, Ohio

Continuation of Ser. No. 310,455, filed Oct. 13, 1981, abandoned. This application May 11, 1983, Ser. No. 493,652
Int. Cl.³ A01K 31/16
U.S. Cl. 119—45 R 6 Claims



1. A removable poultry nest bottom of variable width, to be selectively placed within poultry nests of various sizes comprising:

said nest bottom consisting entirely of synthetic resin molded in one piece;

a rigid bottom portion of rectangular shape having two opposite sides and two opposite ends;

at least two rigid side portions;

integral sheet material hinge means respectively connecting said side portions to said sides of said bottom portion so that said bottom portion and side portions lie in a common plane in the normal unstressed condition of said hinges, with said side portions being on opposite sides of said bottom portion;

said bottom portion and side portions being constructed of planar sheets having a thickness substantially greater than the thickness of said hinge means, and further having coplanar flat top surfaces in the unstressed normal position;

a plurality of rib means extending downwardly from the bottom surface of said side portions and said bottom portion for reinforcing said sheets and spacing said sheets away from the support surfaces of the nest;

said hinge means being sufficiently thin and flexible to permit resilient movement of said side portions between the normal position and a position extending upwardly at right angles to said bottom portion selectively without material fatigue; and

said hinges being continuous throughout the length of said side portions and bottom portion.

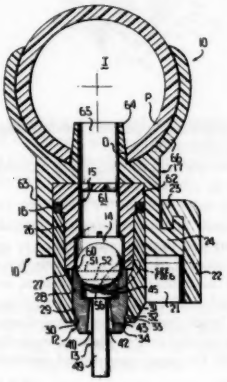
4,524,724
NIPPLE FOR FEEDING LIQUIDS TO FOWL AND/OR SMALL ANIMALS

Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Apr. 2, 1984, Ser. No. 595,577
Int. Cl.³ A01K 7/06; F16K 1/44
U.S. Cl. 119—72.5 7 Claims

1. A nipple particularly adapted for feeding liquid to fowl and/or small animals comprising a housing, a metallic insert in said housing, means for defining a passage through said metallic insert through which liquid is adapted to pass from an upstream passage portion to a downstream passage portion, valve means in said passage for controlling the flow of liquid therethrough, said valve means including a metallic spherical ball of a predetermined diameter and first and second peripheral valve seats within said upstream passage portion, said first peripheral valve seat being upstream from said second peripheral valve seat, said first peripheral valve seat having a diame-

ter less than said ball predetermined diameter but greater than the diameter of said second peripheral valve seat, said metallic ball being seated under the influence of gravity/liquid pressure upon each of said first and second peripheral valve seats in a closed position of said valve means and defining therewith respective first and second liquid seals, a stem disposed in part within said passage, said stem having an interior end portion adjacent said metallic ball and an exterior end portion projecting outwardly of said downstream passage portion whereby fowl and/or small animals can manipulate said stem to move said metallic ball and unseat the same from said first and second peripheral valve seats breaking said respective first and second liquid seals and effecting liquid flow through said passage means, means immediately upstream of said first peripheral



valve seat for contacting said metallic ball for both centering said metallic ball relative to both said first and second peripheral valve seats and for preventing the establishment of high impact closing forces between said metallic ball and second peripheral valve seat thereby assuring repetitive formation of said first and second seals absent damage to said metallic ball, said first peripheral valve seat being a concavely curved surface, said second peripheral valve seat being a concavely curved surface, said concavely curved surfaces beiqg mirror images of an exterior surface of said spherical ball, and said centering and preventing means being a smooth convex surface defined by a plurality of successive diameters each of which is progressively greater than the diameter of said first peripheral valve seat.

4,524,725

SELF-CLEANING HEAT EXCHANGER

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 30, 1983, Ser. No. 509,541

Int. Cl.³ F22D *1/00*

U.S. Cl. 122—7 R **8 Claims**

1. Apparatus comprising

(a) a carbon black reactor

(b) a steam generator; and

(c) conduit means connecting the carbon black reactor to the steam generator;

wherein the steam generator comprises a shell and tube heat exchanger containing a plurality of tubes formed into a tube bundle with each tube having a sidewall formed from a porous material.

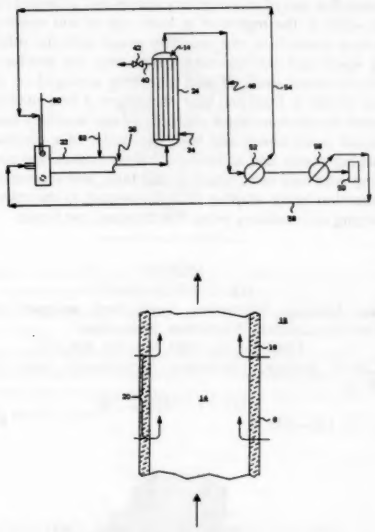
5. A process comprising

flowing a gaseous stream containing a particulate material from a carbon black reactor through the tube side of a shell and tube heat exchanger;

introducing a fluid medium into the shell side of the shell and tube heat exchanger, said fluid medium being at higher pressure than said gaseous stream;

heating a first portion of the fluid medium by indirect heat exchange with the gaseous stream;

withdrawing the first portion of the heated fluid medium from the shell side of the heat exchanger;



flowing a second portion of the fluid medium through pores in the tube walls and into the tube side of the shell and tube heat exchanger, said second portion of the fluid medium flowing through the tube walls along at least most of the length of at least most of the tubes in the tube bundle.

4,524,726

UTILITY WATER BOILER

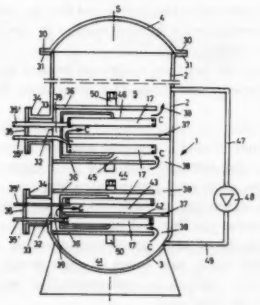
Max Bindl, Wernberger Strasse 41, D-8473 Pfreimd, Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 567,963

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 8303845

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—13 R **9 Claims**



1. A liquid boiler, particularly a utility-water boiler, which comprises a tank with connections extending into the inside of

the tank for the feeding and removal of the liquid; at least two walls within said tank spaced apart from one another to define at least two auxiliary spaces, said auxiliary spaces being separated from one another and from the rest of the inner space of said tank by said walls, said walls having openings therein for connecting said auxiliary spaces with each other and with the rest of the inner space of said tank; at least one heat exchanger which forms at least one closed conduit for a heat carrier fluid arranged in one of said auxiliary spaces and arranged on one of said walls in the region of at least one of said openings, said opening connecting one auxiliary space with the other auxiliary space and said opening connecting one auxiliary space with the inner space of said tank beig arranged on different sides of said at least one heat exchanger; a first auxiliary connection in communication with one of said auxiliary spaces and adapted to be connected with the outlet of a circulating or charging pump; and a second auxiliary connection communicating with said inner space of said tank, said second auxiliary connection being adapted to be connected to the inlet of said charging or cirulating pump for carrying the liquid.

4,524,727

HEAT EXCHANGER

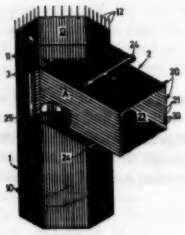
Heinz Ammann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 31, 1984, Ser. No. 636,270

Claims priority, application Switzerland, Aug. 5, 1983, 4256/83

Int. Cl.³ F22B *27/04*

U.S. Cl. 122—235 A **8 Claims**



1. A heat exchanger comprising

a vertical gas flue having a plurality of boundary walls, each said wall including a plurality of support tubes and medium-carrying tubes disposed in welded-together gas-tight relation;

at least one transverse gas flue branching from said vertical gas flue and having a plurality of boundary walls, each said wall of said transverse gas flue including a plurality of medium-carrying tubes disposed in welded-together gas-tight relation;

a plurality of headers, each said header being connected in common to said tubes of a respective transverse gas flue wall;

said medium carrying tubes of said vertical flue at a branch-off point of said transverse gas flue being bent outwardly from said vertical flue and said transverse gas flue in groups, each said group extending to a common vertical plane extending parallel to a longitudinal axis of said transverse gas flue and passing upwardly through respective walls of said transverse gas flue in said common vertical plane, said tubes of each group being welded in gas-tight relation to said respective walls of said transverse gas flue; and

at least some of said tubes of said transverse gas flue being bent at said vertical gas flue to fill a space in said vertical gas flue between said transverse gas flue and said branch-off point of said bent tubes of said vertical gas flue.

4,524,728

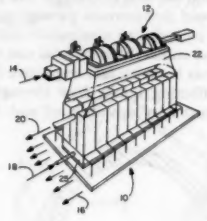
STEAM CONDENSING APPARATUS

Benjamin M. Johnson, Kennewick, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 25, 1983, Ser. No. 512,342

Int. Cl.³ F22G *1/00*

U.S. Cl. 122—459 **12 Claims**



1. A steam condenser apparatus, comprising:

(a) housing means defining

(i) a first inlet plenum for receiving a continuous supply of steam to be condensed,

(ii) a second inlet plenum for receiving a continuous supply of liquid ammonia which is intended to condense said steam and thereby vaporize,

(iii) a first outlet plenum for receiving water resulting from the condensation of said steam, and

(iv) a second outlet plenum for receiving said ammonia after the latter has condensed said steam and has vaporized said second outlet plenum including an outlet arrangement for separating liquid ammonia from ammonia vapor;

(b) means for supporting a number of thermally conductive sheets in spaced-apart confronting relationship to one another within said housing means so as to define therebetween

(i) a plurality of first passageways extending from said first inlet plenum to said first outlet plenum for passing steam and/or water therethrough from said first inlet plenum to said first outlet plenum, and

(ii) a plurality of second passageways extending from said second inlet plenum to said second outlet plenum physically isolated from and disposed between respective ones of said first passageways for passing ammonia therethrough from said second inlet plenum to said second outlet plenum whereby to cause the steam in the adjacent first passageways to condense;

(c) means for directing a continuous supply of steam into said first inlet plenum for movement through said first passageways; and

(d) means for directing a continuous supply of liquid ammonia into said second inlet plenum for movement through said second passageways.

4,524,729

PRIMARY MANWAY CLOSURE REDUNDANT RESTRAINT

Frank P. Hill, Jr., Signal Mountain; John W. Alden, Jr., Chattanooga, and Harry K. Williams, Signal Mountain, all of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

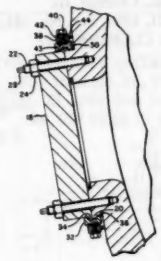
Filed Nov. 12, 1982, Ser. No. 440,886

Int. Cl.³ F23M *7/00*

U.S. Cl. 122—498 **5 Claims**

1. In combination, a vessel, opening means in the vessel, a cover, flange means surrounding the opening means, a primary closing means for the cover including a plurality of studs securing the cover onto the vessel, the studs having inner ends threaded into openings in the vessel, nuts cooperating with the outer ends of each of the studs, secondary closing means for the cover including cylindrical clamp means made up of more

than one piece, a protruding ledge on the cover over which the clamp means extends, an annular groove in the flange means into which the clamp means extends, a circular retaining ring which surrounds the clamp means, a plurality of threaded



openings in the retaining ring, and a plurality of set screws threaded into the openings, so that their ends force the clamp means into tight clamping engagement with the ledge on the cover and the groove in the flange means.

4,524,730

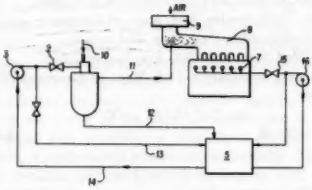
METHOD FOR IMPROVING FUEL EFFICIENCY AND REDUCED EMISSIONS IN INTERNAL COMBUSTION ENGINES

Brant Doell, Tulsa, and John T. Wright, Broken Arrow, both of Okla., assignors to Doellwood Financial, Inc., Tulsa, Okla.

Filed Aug. 19, 1983, Ser. No. 524,550

Int. Cl.³ F02B *49/00*

U.S. Cl. 123—27 GE **4 Claims**



1. A system for improving the efficiency of a diesel internal combustion engine having a principle fuel supply and delivery system comprising a means for mixing said fuel and air, and an air intake stream, thereby improving fuel efficiency and reducing pollutants therefrom, comprising:

providing, as an adjunct to said principle engine fuel supply system, vaporized fuel drawn from said principle fuel supply to said air intake stream downstream of said mixing means, whereby said vaporized fuel is distributed to at least one combustion chamber of said engine, said vaporized fuel being supplied by a vaporization chamber in fluid communication with said principle fuel supply whereby said vaporized fuel is drawn from said principle fuel supply for vaporization in said vaporization chamber.

4,524,731

HYDRAULIC VALVE LIFTER WITH CONTINUOUS VOID

Jack L. Rhoads, P.O. Box 830, Taylor, Ariz. 85939

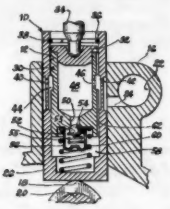
Filed Aug. 15, 1983, Ser. No. 523,119

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.57 **3 Claims**

1. In a hydraulic valve lifter having a hollow cylindrical body with a closed lower end for engagement with a cam; a hollow cylindrical plunger axially slidable in said body and enclosing a pressure chamber in the lower end of the body; an external collecting channel in said body to receive oil from a pressurized source; a port opening into said body from said channel; a port in said plunger communicating with said first-mentioned port to admit into the plunger; and a one-way valve in said plunger opening into said pressure chamber; an improvement comprising:

(a) an oil bleed passageway defined in the exterior of said



plunger extending the full length of said plunger providing continuous communication therethrough from one end of said plunger to the other when same is seated in said body;

(b) said bleed passageway comprising a groove and being dimensioned and cross-sectioned to be inadequate to sustain oil bleed beyond a pre-determined volumetric flow at high engine speeds.

4,524,732

CYLINDER HEAD OF A PISTON ENGINE

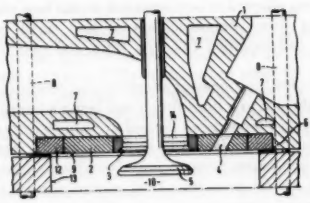
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf; Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany; Martti J. A. Hakulinen, Rönninge, and Bengt N. J. Palm, Nykvarn, both of Sweden, assignors to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,173

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307114

Int. Cl.³ F02F *1/24;* **F02B** *77/11*

U.S. Cl. 123—193 H **12 Claims**



1. In a cylinder head of a piston engine having a thermal insulation component for the cylinder head bottom facing the combustion chamber, and including openings therethrough; the improvement comprising

the entire cylinder head bottom facing the combustion chamber being covered by said thermal insulation component formed as a single layer and comprising an outer planar support ring of zirconium oxide being secured to the cylinder head bottom; and a plate of aluminum titanate sized to form the greater part of the thermal insulation component and being peripherally gripped by said outer zirconium oxide ring.

4,524,733

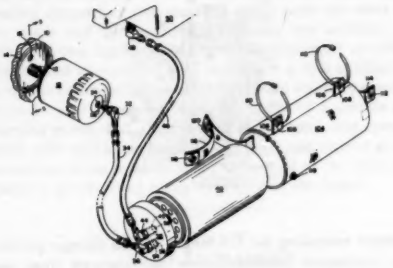
MODIFIED FULL-FLOW FILTER AND BY-PASS FILTER APPARATUS FOR INTERNAL COMBUSTION ENGINES

Donald R. Schmidt, San Antonio, Tex., assignor to Encon Systems, Ltd., San Antonio, Tex.

Continuation-in-part of Ser. No. 513,733, Jul. 14, 1983, Pat. No. 4,452,695. This application Nov. 14, 1983, Ser. No. 550,872

Int. Cl.[3] F01M *1/00*

U.S. Cl. 123—196 A 11 Claims



1. Filter apparatus for an internal combustion engine adapted for replacing a normal spin-on full-flow oil filter threadably connected to an oil filter bushing, said engine having an oil pan at a low pressure side of an oil system having an oil pump, said apparatus comprising:

a modified high performance full-flow filter adapted to be connected to said oil filter bushing to permit oil within said oil system to flow into said modified full-flow filter and to permit most of said oil to flow outward therefrom after filtering thereof by said modified full-flow filter, said modified full-flow filter being further adapted to permit a small portion of said oil to flow outward therefrom prior to filtering thereof through a by-pass bushing located along a centerline of said modified full-flow filter opposite said oil filter bushing;

a by-pass filter for filtering said small portion of oil, said by-pass filter having a base plate connected thereto;

a first flexible hose member adapted to be connected on a first end thereof to a first fitting and being adapted to be connected on a second end thereof to a second fitting, said first fitting being adapted to be connected to said by-pass bushing of said modified full-flow filter and said second fitting being adapted to be connected to said base plate for permitting flow communication of said small portion between said modified full-flow filter and said by-pass filter;

a second flexible hose member adapted to be connected on a first end thereof to a third fitting and being adapted to be connected on a second end thereof to a fourth fitting, said third fitting being adapted to be connected to said base plate and said fourth fitting being adapted to be connected to said oil pan for permitting flow communication of said small portion between said by-pass filter and said oil pan; and

means for mounting said by-pass filter with respect to said engine, said modified full-flow filter and said by-pass filter being of such respective densities and filtering capabilities that said most of said oil flows from said oil pump through said modified full-flow filter to be filtered therein with a minimum pressure drop and said small portion of oil from said oil pump flows through said modified full-flow filter to be filtered by said by-pass filter prior to returning to said oil pan;

a least one of said first, second, third and fourth fittings being a right angle fitting that may be rotated after fluid tight connection to give a right angle fitting oriented in any direction in a given plane.

4,524,734

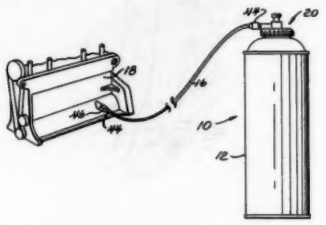
APPARATUS AND METHOD FOR ENGINE PRELUBRICATION

Thomas J. Miller, Palos Heights, Ill., assignor to Topline Automotive Engineering Inc., Chicago, Ill.

Filed Feb. 21, 1984, Ser. No. 581,959

Int. Cl.[3] F01M *1/12*

U.S. Cl. 123—196 S 5 Claims



1. Apparatus for prelubricating engines including a portable pressure containment vessel having a valve therein; a premeasured volume of prelubricant of predetermined formulation in the vessel; a compressible propellant in the vessel, the quantity of said propellant defining a minimum initial vessel pressure; valve actuator means; means for attaching the actuator means to the vessel in air-tight relationship to the valve means; hose means adapted to interconnect the valve actuator means and an engine requiring prelubrication whereby the prelubricant is discharged throughout an engine upon opening the actuator means.

4,524,735

RECIPROCATING PISTON ENGINE

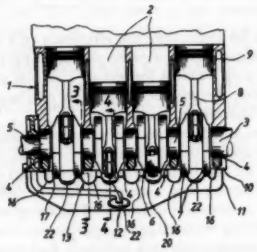
Armin Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to Audi AG, Neckarsulm, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,103

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334044

Int. Cl.[3] F01M *1/00*

U.S. Cl. 123—196 R 5 Claims



1. Reciprocating piston engine, in particular for motor vehicles, comprising a cylinder-crankcase (1) with a plurality of cylinders (2) having central axes which lie in a common plane (14), a crankshaft (3) supported by bearings (4) within said crankcase, said crankshaft comprising crank pins (6) and crank webs (7), said crankcase having a bottom opening (10) with longitudinal edges extending parallel to the crankshaft, said opening (10) being closed by an oil pan (11), and further comprising an insert (13) between the crankshaft and the bottom of the oil pan, said insert extending substantially over the whole length of the said bottom opening, characterized in that said insert (13) extends from that longitudinal edge (15) of said bottom opening (10), which lies in the direction of rotation (D)

of the crankshaft (3) behind the plane (14) comprising the cylinder axes in opposite direction to said direction of rotation (d) without interruption substantially up to said plane (14) to separate the leading portion of the oil pan from the interior of the crankcase.

4,524,736

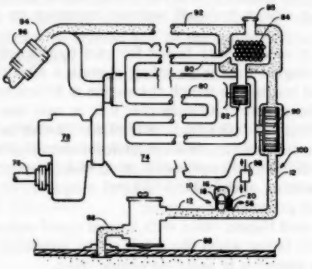
FLUID FLOW FAILURE DETECTION MEANS

Robert L. Sackett, 3597 Hancock St., San Diego, Calif. 92110

Filed Jan. 23, 1984, Ser. No. 572,907

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 D **1 Claim**



1. Means for detecting the failure of the force of flow of water pumped through the cooling system of an internal combustion fuel burning engine for the cooling thereof, said engine including interruption means for interrupting its normal running operation comprising:

an input conduit;

a flow failure detecting device interconnected to said input conduit, said flow detection device comprising, a first tubular conduit connected in series with said input conduit and communicating therewith, a second tubular conduit communicating with said first tubular conduit intermediate its ends, a translating member freely translatable relative to said second tubular conduit, said translating member being influenced by the force of the flow of said water through said first conduit and including a permanent magnet associated therewith, a reed switch positioned externally of said second tubular conduit, said reed switch having an open and closed state whereby the location of said magnet influences the state of said reed switch;

a pump for pumping said water through said input conduit and said cooling system of said engine; and

an output conduit for exhausting said water from said cooling system,

said reed switch is interconnected to said engine interruption means whereby insufficient water flow force through the cooling system changes the state of said reed switch thereby causing interruption of the normal running of said engine.

4,524,737

FUEL INJECTION APPARATUS WITH AN AUXILIARY PUMP FOR PILOT AND MAIN INJECTION

Eberhard Hofman, Kirchberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

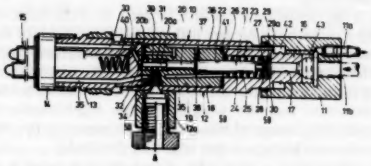
Filed Aug. 24, 1984, Ser. No. 644,007

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330771

Int. Cl.³ F02M *45/02*

U.S. Cl. 123—300 **10 Claims**

1. A fuel injection apparatus having an auxiliary pump for pilot and main injections in internal combustion engines, wherein a pilot injection quantity pumped via an inlet by a low-pressure pump is stored ahead of a pilot injection piston and is positively displaced to an injection nozzle by said last named piston, upon said piston being driven by the supply pressure of a high-pressure injection pump, characterized in that said pilot injection piston further includes a pressure piston and is driven by a coaxially disposed intermediate piston with each of said pistons being disposed in a cylindrical intermediate element provided with pressure lines and leak-off lines of said



auxiliary pump, that said intermediate element being disposed between a connection piece and a nozzle holder is provided with a double needle nozzle, and further that said intermediate element has an outer dimension which does not exceed the diameter of the injection nozzle comprising an injection valve.

4,524,738

PROCESS AND DEVICE FOR CONTROLLING THE IDLING SPEED OF A HEAT ENGINE

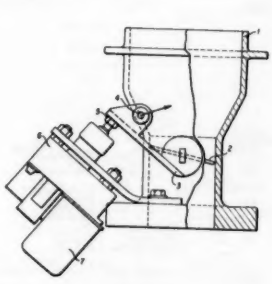
Paul Chastagner, Les Clayes Sous Bois, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Sep. 7, 1983, Ser. No. 530,108

Claims priority, application France, Sep. 7, 1982, 82 15193

Int. Cl.³ F02D *9/02, 31/00*

U.S. Cl. 123—339 **7 Claims**



1. A process for controlling the idling speed of a heat engine with controlled ignition by modification of air flow admitted to an intake mainfold of the engine when predetermined idling conditions are detected, said modification of air flow being performed by a double-action actuator that causes a passage section of a bypass to vary in parallel with a gas butterfly or a position of an idling stop of said butterfly, wherein a control signal for controlling the actuator according to an instruction value is processed by a microprocessor receiving signals associated with pedetermined input parameters, including a signal indicative of a primary current for ignition, and wherein for each ignition pulse provided by the interruption of the primary current the process comprises:

(a) counting clock signals by means of a counter, storing the contents of the counter in a period memory, after the contents of the period memory have been transferred into a preceding period memory, and then resetting the clock signals counter to zero;

(b) determining an instruction period from a table of values, as a function of said predetermined input parameters, including the temperature of the cooling water of the engine;

(c) determining a deviation between the stored period and the instruction period;

(d) determining a threshold from a table of values, as a function of the deviation;

(e) determining a slope as a difference between the period and the preceding period;

(f) determining a maximum slope, if the deviation is negative and at least if the slope is positive, also as a function of the deviation;

(g) if the deviation is positive or zero, or if the slope is negative or zero, or further if the slope is less than or equal to said maximum slope, determining a weighted slope produced from the slope by a number (N) of predetermined weight, computing the new value of a sum by adding the deviation and the weighted slope algebraically to the preceding value of this sum, and comparing the absolute value of this new value with the threshold;

(h) determining a remainder, if said absolute value is greater than or equal to the threshold, as a difference between the sum and the threshold; and

(i) determining, as a function of predetermined comparisions between the above-determined values, whether or not said control signal, which represents a predetermined basic corrective action, should be sent to the actuator and in what direction, before memorizing the remainder as the sum to recommence a new cycle while awaiting a new ignition interruption.

4,524,739

ENGINE CONTROL METHOD

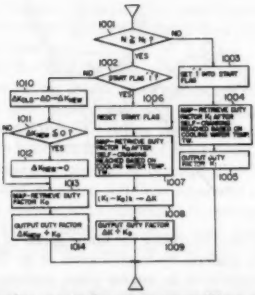
Mineo Kashiwaya; Kiyomi Morita, and Masahide Sakamoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1983, Ser. No. 555,015

Claims priority, application Japan, Nov. 24, 1982, 57-204667

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—339 **12 Claims**



1. In an engine control system comprising an intake path communicated with each cylinder of the engine through an intake manifold; a throttle valve provided in said intake path; a bypass provided in parallel with said throttle valve for enabling a flow of intake air into a lower portion of said throttle valve to bypass said throttle valve; a bypass valve for controlling an opening area of said bypass; a plurality of sensors including an angle sensor means for producing a pulse signal in synchronism with the revolutions of the crankshaft of the engine, an opening sensor means for producing a first output representing a first state of said throttle valve with said throttle valve in a substantially completely closed state and a second output representing a second state of said throttle valve when said throttle valve is not in the substantially closed state, and a water temperature sensor for detecting the temperature of cooling water of the engine; a central processing means for computing a value of duty factor for said bypass valve in response to the respective outputs of said plurality of sensors; and a pulse generating circuit means responsive to the output of said central processing means for supplying said bypass valve with a pulse signal representing the computed value of duty factor, said central processing means computes the number of engine revolutions on the basis of the output pulse signal of said angle sensor and the duty factor for said bypass valve is computed in accordance with the computed value of the number of engine revolutions and of the output of said angle sensor means; an engine control method comprising the steps of:

computing the duty factor for said bypass valve on the basis of the outputs of said plurality of sensors in an idle running operation of the engine;

supplying said bypass valve with a pulse signal representing a predetermined duty factor on the basis of said computed value of the duty factor;

obtaining a first duty factor for said bypass valve in a first engine state before a state has been reached in which the engine is driven by itself without requiring an external force;

obtaining a second duty factor for said bypass valve in a second engine state in an idling operation after the state has been reached in which the engine is driven by itself;

judging the engine state such that it is in said first engine state when said computed value of the number of engine revolutions is smaller than a predetermined value and that it is in said second engine state once said computed value of the number of engine revolutions is equal to or greater than said predetermined value;

supplying said bypass valve with a pulse signal representing first duty factor when the result of the judgment proves that the engine is in said first engine state;

supplying said bypass valve with a pulse signal representing an initial duty factor which is a predetermined value between said first and second duty factors when judgment is made that the engine state is changed from said first engine state to said second engine state;

supplying said bypass valve successively with a pulse signal representing a duty factor obtained by a step by step decreasing of said initial duty factor by a fixed value at predetermined time intervals; and

wherein said first and second duty factors are determined on the basis of the detected value of cooling water temperature of the engine.

4,524,740

COUPLING MEANS BETWEEN AN OUTPUT CONTROL MEMBER OF AN INTERNAL COMBUSTION ENGINE AND AN ACTUATOR MEMBER

Herbert Brockhaus, Wettstetten, Fed. Rep. of Germany, assignor to Audi NsU Auto Union AG., Ingolstadt, Fed. Rep. of Germany

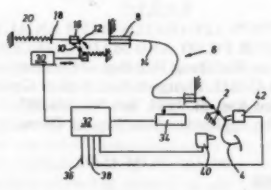
PCT No. PCT/DE82/00157, § 371 Date Mar. 24, 1983, § 102(e) Date Mar. 24, 1983, PCT Pub. No. WO83/00534, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 28, 1982, Ser. No. 480,948

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131553

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—340 **9 Claims**



1. Coupling means between a throttle valve member of an internal combustion engine and a manually moveable actuator member, the internal combustion engine comprising electronic control means for controlling the movement of the throttle valve member in dependency of the position of the actuator

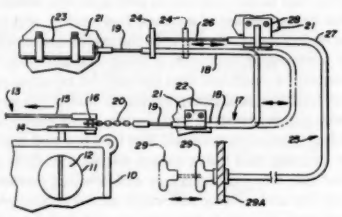
member and at least one operating parameter of the internal combustion engine within a range lying between a full-load position and a minimum opening, the coupling means moving the throttle valve member to its full-load position when the actuator is fully actuated, the coupling means comprising a mechanical connection including a lost-motion connection between the actuator member and the throttle valve member which connection for a given change in position of the actuator member in the range of small actuations associates a smaller change in position of the throttle valve member than for a given change in the position of the actuator member in the range of larger actuations, whereby the lost-motion connection is operative within about the first half of the range of actuation of the actuator member, and the mechanical connection provides a mechanical override means for the control device within about the second half of the range of actuation of the actuator member.

4,524,741

PRESET THROTTLE RELEASE DEVICE

Ronald W. Corbi, 368 Edgewood Dr., Columbiana, Ohio 44408

Filed May 10, 1984, Ser. No. 609,028
Int. Cl.³ F02D *3/00*
U.S. Cl. 123—342 **6 Claims**



1. A preset throttle release for use on drag racing vehicles including an engine, a throttle linkage movable between a full opened and a closed position wherein said preset throttle release comprises a first cable assembly extending between said throttle linkage and a selective cable restraint means, said first cable assembly having a predetermined effective length for normal throttle linkage travel, means for adjustably foreshortening the effective length of said first cable assembly wherein said throttle linkage travel is restrained, means for presetting said effective length of said first cable assembly and means for releasing said foreshortened effective length of said first cable assembly while maintaining said presetting of said effective length of said first cable assembly.

4,524,742

CARBURETOR HAVING ELECTRONICALLY CONTROLLED ELEMENTS FOR MAINTAINING ENGINE IDLING SPEED AT A CONSTANT LEVEL AND FOR CONTROLLING CHOKE-VALVE POSITION DURING A WARM-UP PHASE

Silverio Bonfiglioli, Zola Predosa, and Innocenzo Triolo, Bologna, both of Italy, assignors to Weber S.p.A., Turin, Italy

Filed Dec. 16, 1983, Ser. No. 561,994
Claims priority, application Italy, Dec. 20, 1982, 3627 A/82
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—438 **5 Claims**

1. A carburetor for an internal combustion engine, for maintaining an idling speed of said engine at a constant level and for controlling a position of a choke valve associated with said carburetor during an engine warm-up phase, said carburetor comprising:

(a) a main barrel;

(b) a throttle valve;

(c) idle speed circuit control means;

(d) a choke valve;

(e) a primary fuel circuit opening into said barrel between said throttle valve and said choke valve;

(f) first sensor means disposed in an engine head of said engine for monitoring cooling water temperature of cooling water associated with said engine and for providing signals indicating said cooling water temperature;

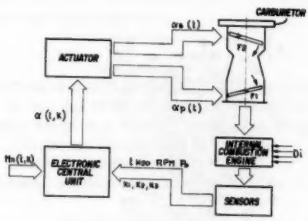
(g) second sensor means for monitoring engine RPM and for providing signals indicating said RPM;

(h) third sensor means for monitoring intake manifold absolute pressure and for providing signals indicating said pressure;

(i) first positioning means for positioning said throttle valve when an accelerator of said engine is in a non-depressed rest position, in a plurality of angular positions as a function of said cooling water temperature;

(j) second positioning means for positioning said choke valve as a function of said cooling water temperature to limit an amount of opening of said choke valve caused by air sucked into said carburetor by said engine, said second positioning means including elastic means for biasing said choke valve by an amount of force required to close said choke valve to prevent pivoting of said choke valve when said engine is turned off;

(k) a central processing unit receiving signals from said first, second and third sensors for controlling said first and second positioning means to position said throttle valve and said choke valve respectively; and



(l) said second positioning means including;

(i) a step motor;

(ii) a first cam rotatably controlled by said step motor;

(iii) a choke valve shaft on which said choke valve is mounted;

(iv) a second lever connected to said choke valve shaft to pivot therewith;

(v) first rod means having one end connected to said second lever such that when said second lever pivots with said choke valve shaft said end of said first rod means pivots therewith;

(vi) a first lever pivotable about an axis interposed between said first rod means and said first cam, said first lever having one end contacting a contour of said first cam and another end pivotably connected to an end of said first rod means;

(vii) said elastic means including a spring tending to bias said first rod means to oppose action by air sucked by said engine which tends to open said check valve; and

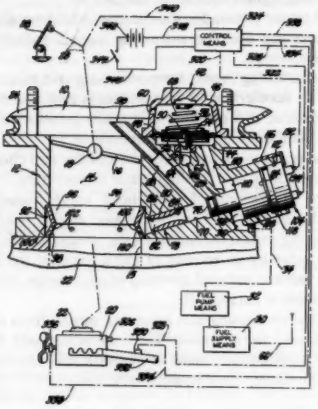
(viii) a member disposed on an end of said first lever, having a contour shaped for limiting downward axial movement of said first rod means to position said choke valve in predetermined positions as a function of said cooling water temperature, whereby a predetermined angular position of said first cam determines a static position of said choke valve.

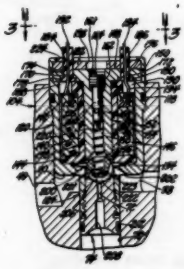
4,524,743

FUEL INJECTION APPARATUS AND SYSTEM

Lawrence McAuliffe, Jr., Warren, and Richard Chauvin, Clawson, both of Mich., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,820
Int. Cl.³ F02M 7/00
U.S. Cl. 123—438 10 Claims





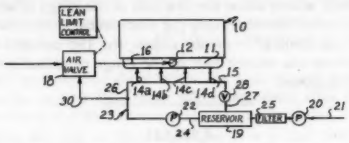
1. A valving assembly for variably restricting fluid flow, comprising housing means, bobbin means situated in said housing means, said bobbin means comprising a generally medially situated tubular body portion, electrical field coil means carried by said bobbin means, pole-piece means situated generally within said tubular body portion, a valve seat member, fluid flow passage means formed through said valve seat member, said pole-piece means comprising a pole-piece face portion, a valve member situated generally between said pole-piece face portion and said valve seat member, said valve member comprising at least a portion thereof of generally spherical configuration, said portion of generally spherical configuration having a center of curvature, wherein said portion of generally spherical configuration is directed generally toward said valve seat member, and resilient means normally resiliently urging said valve member toward a direction whereby said portion of generally spherical configuration moves toward operative seating engagement with said valve seat member as to thereby terminate flow through said fluid flow passage means, a recess formed in said valve member, said recess extending through a side of said valve member and through said center of curvature, said recess terminating in an internal reaction end surface means disposed generally on a side of said center of curvature opposite to where said recess extends through the side of said valve member, at least a portion of said resilient means being received within said recess and operatively abutting against said internal reaction end surface means, said valve member comprising armature means of said electrical coil and said pole-piece means.

4,524,744

FUEL SYSTEM FOR COMBUSTION ENGINE

William D. Adams, P.O. Box 461, Austell, Ga. 30001

Filed Jan. 3, 1983, Ser. No. 455,002
Int. Cl.³ F02M 63/02
U.S. Cl. 123—459 5 Claims



1. Fuel injection apparatus, for a spark ignition internal combustion engine having at least one cylinder and an air inlet, an injection nozzle for injecting fuel into said cylinder, a fuel feed line in direct communication with said injection nozzle for supplying fuel under pressure to said injection nozzle, said fuel feed line being one leg of a closed fuel circuit, said fuel circuit further including a fuel reservoir, means for maintaining a level of fuel within said reservoir, a pump for pumping fuel from said reservoir to said fuel feed line and for creating pressure in said fuel feed line, said pump having an output greater than the maximum requirements of said engine, valve means connected in said fuel circuit between said fuel feed line and said reservoir so that opening said valve means allows fuel flow from said fuel feed line into said reservoir and releases pressure of said fuel feed line and closing said valve means retains pressure on said fuel feed line, said pressure on said fuel feed line being directly communicated to said injection nozzle, and an air valve for controlling air flow to said air inlet, said air valve including a cylinder, piston means within said cylinder, said cylinder being in fluid communication with said fuel circuit between said pump and said feed line, said piston being movable in a first direction in response to high pressure in said fluid circuit, and spring means for urging said piston means in the opposite direction, a valve member for said air valve, said valve member being moved to allow increased air flow when said piston is moved in said first direction and to close said air valve for restricting air flow when said piston is moved in said opposite direction, the arrangement being such that said pressure on said fuel feed line is the only force that urges said piston means in said first direction, and spring force of said spring means is the only force that urges said piston means in said opposite direction.

4,524,745

ELECTRONIC CONTROL FUEL INJECTION SYSTEM FOR SPARK IGNITION INTERNAL COMBUSTION ENGINE

Noboru Tominari, No. 19-9, Kamiyama-cho, Shibuya-ku, Tokyo, and Takashi Ishida, Kanagawa, both of Japan, assignors to Mikuni Kogyo Co., Ltd. and Noboru Tominari, both of Tokyo, Japan

Continuation of Ser. No. 228,973, Jan. 27, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 538,843
Claims priority, application Japan, Jan. 31, 1980, 55-10218
Int. Cl.³ F02D 5/00
U.S. Cl. 123—478 13 Claims

1. An electronic control fuel injection system for a spark ignition internal combustion engine for preferentially determining fuel flow rate according to the stroke of an accelerator pedal and subordinately determining airflow rate to the engine

in response to the fuel flow rate and the engine operating state comprising:

an air intake passage having a throttle valve therein for supplying air to said engine;

a fuel selecting mechanism for selecting a fuel discharge amount in accordance with a depression stroke of an accelerator pedal;

an exhaust gas recirculation rate control device;

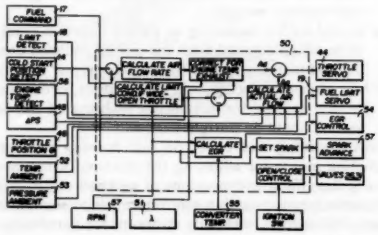
at least one fuel injector for injecting said selected fuel discharge amount into said engine;

means for detecting the amount of intake air to said engine comprising first means for providing a signal representing a pressure difference in said air intake passage on the upstream and downstream sides of said throttle valve, and a second means for providing a signal representing the actual opening position of said throttle valve;

an engine rotational speed detecting sensor;

an engine temperature sensor;

a computer for selectively receiving signals from said fuel selecting mechanism indicating a selected fuel discharge amount, from said first means for providing a signal representing said pressure difference, from said second means for providing a signal representing the actual opening position of said throttle valve and from said rotational



speed and temperature sensors, for producing from the signal from said fuel selecting mechanism a first fuel supply output signal which controls the amount of fuel injected by said injector so that said selected fuel discharge amount is supplied to said engine, and for producing from said pressure difference signal, from a signal representing an injected fuel flow amount, and from the signal indicating the actual opening position of said throttle valve, a second optimum air supply amount output signal, said computer adjusting at least one of said first and second output signals in accordance with the signal from said temperature sensor, said computer further producing from the signal from said rotational speed detecting sensor a fuel limiting signal, the amount of fuel discharged by said injector being limited independently of the depression stroke of the accelerator pedal in response to said fuel limiting signal, said computer also producing a third output signal which controls said exhaust gas recirculation rate control device in response to said engine rotational speed signal and said signal representing the selected fuel discharge amount; and,

a throttle valve control mechanism for setting the opening of said throttle valve according to said second output signal from said computer to provide an optimum air supply amount to said engine.

4,524,746

CLOSED CIRCUIT FUEL VAPOR SYSTEM

Earl S. Hansen, P.O. Box 925, Willits, Calif. 95490

Filed Apr. 9, 1984, Ser. No. 598,364

Int. Cl.³ F02M *31/00, 27/08;* **B05B** *17/06*

U.S. Cl. 123—538 **5 Claims**

1. A fuel delivering system for an internal combustion engine comprising:

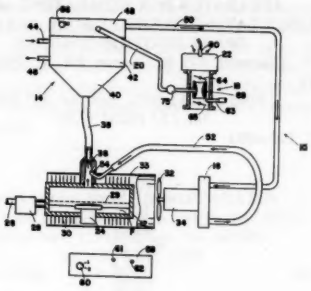
a closed vaporizer chamber;

a closed heat exchanger; and

a pump;

duct means connecting said vaporizer chamber, said heat exchanger, said pump and said vaporizer chamber in continuous series to form a closed circuit, oxygen-free vapor supply;

means for introducing liquid fuel into said chamber;



an ultrasonic transducer in said chamber for vaporizing liquid fuel;

a carburetor with a venturi throat therein; and

a duct connected from said closed circuit just downstream of said heat exchanger to said venturi throat so that said carburetor can draw off heated vapor from said closed circuit to meet engine demand.

4,524,747

EVAPORATING-PRESSURE REGULATING DEVICE

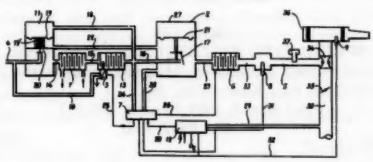
Adrianus M. M. van den Wildenberg, Geldrop, and Andreas L. M. T. Smeets, Eindhoven, both of Netherlands, assignors to Vialle B.V., Eindhoven, Netherlands

Filed Feb. 6, 1984, Ser. No. 577,112

Claims priority, application Netherlands, Feb. 4, 1984, 8300441

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **6 Claims**



1. An evaporating pressure regulating device for liquefied gas to be evaporated into gas for an internal combustion engine comprising an inlet conduit receiving liquefied gas from a source of liquefied gas, a first pressure reducing means receiving liquefied gas from said inlet conduit, and metering the gas at a controlled rate to reduce the pressure thereof, a heater-/evaporator receiving the gas from the first pressure reducing means for gasifying and heating the same, a second pressure reducing means receiving gas from the heater/evaporator, an adjustable injection means between the heater/evaporator and second pressure reducing means for injecting liquefied gas into the heated gas leaving the heater evaporator for controllably varying the temperature of the gas going to the second pressure reducing means, an outlet conduit from the second pressure reducing means leading to an intake manifold of an internal combustion engine, and control means connected to and receiving a gas pressure from each of a point between the

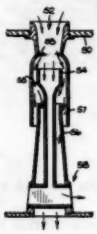
injection means and second pressure reducing means and the outlet conduit, said control means acting on the injection means to vary the amount of liquefied gas in response to pressure signals from the gas pressure at its connections between the injection means and the second pressure reducing means and the outlet conduit.

4,524,748

APPARATUS FOR SEPARATING AND RE-CIRCULATING OVERSIZE FUEL PARTICLES IN SPARK-IGNITION ENGINES

Hugo V. Giannotti, 879 S. Country Rd., E. Patchogue, N.Y. 11772

Filed Jun. 11, 1982, Ser. No. 387,352
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—591 **8 Claims**



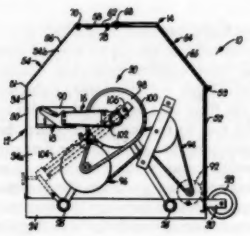
1. Apparatus for reducing the average fuel particle size in an air-fuel mixture for spark-ignition engines comprising inertial means for separating a portion of the air-fuel mixture containing fuel particles greater than a pre-determined size prior to its introduction to the cylinders of the engine, and means for returning the separated portion to the fuel supply system of the engine, said separated portion being re-circulated to the venturi portion of the engine from an area of higher staic pressure, wherin said inertial means comprises a particle separator having an array of elements, each element having a venturi-shaped housing and a centrally aligned trap disposed downstream of the throat into which the flow of fuel particles greater than a pre-determined size is inertially separated.

4,524,749

SPRING-TYPE BALL PITCHING MACHINE

Paul S. Giovagnoli, Kansas City, Mo., assignor to Master Pitching Machine, Inc., Kansas City, Mo.

Filed Nov. 8, 1982, Ser. No. 439,932
Int. Cl.³ F41B *3/02*
U.S. Cl. 124—7 **3 Claims**



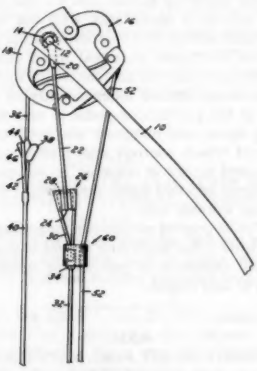
1. A ball pitching machine comprising:
an elongated pitching arm;
a ball-receiving hand secured to said arm;
mechanism for rotating said arm about an axis;
means for successively feeding respective balls to said hand for pitching thereof;
housing structure disposed about said arm, hand and mechanism, including structure defining a ball outlet located to permit pitched balls to pass out of said housing structure, said housing structure including--
a pair of upright, opposed, spaced apart sidewalls each having a rectangular lower portion and a trapezoidal upper portion, with the upper portions each presenting a pair of inclined, converging end margins and a horizontal top margin,
a pair of upright, opposed, spaced apart, end walls joining said sidewall portions, and
a top wall including an inclined section joining one opposed pair of said converging end margins, and a horizontal wall section of lesser length than the length of the opposed top margins, said top wall section extending from the adjacent end of said inclined section and along said top margins for a portion of the length thereof;
cover means for substantially covering said ball outlet when said machine is not in use,
said cover means including--
an elongated planar, intermediate connection section situated between and extending along the length of said opposed top margins,
a second section including an inclined portion configured to be complemental with the pair of inclined converging end margins spaced from said one pair thereof, and
a bolt means connecting said intermediate section and said second section for permitting pivoting of the second section about an upright axis; and
means mounting said cover on said housing structure, including means for adjusting the position of the cover to vary the effective dimensions of said ball outlet, having--
releasable means coupling said intermediate section to said top wall section, including structure for permitting shifting of the intermediate section relative to said top wall portion.

4,524,750

ARCHERY BOW AND CABLE POSITIONER

Rex F. Darlington, Hale, Mich., assignor to Container Specialties, Inc. (by Kleman), Flint, Mich.

Filed Mar. 10, 1983, Ser. No. 474,203
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—23 R **3 Claims**



1. In a compound bow assembly of the type having eccentrically mounted pulleys at each bow limb, a bowstring and a pair of return cables, said pair of return cables including first and second return cables, each return cable anchored respectively

at opposite bow limbs and each passing from the anchored end to a pulley at the end opposite to the anchored end, that improvement which comprises:

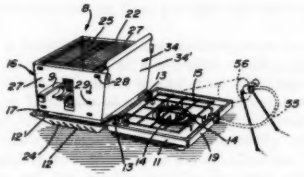
a cable positioner at each end of the bow having a securing portion and a guiding portion, said securing portion being secured adjacent the anchored end of a first return cable, and said guiding portion having a slide passage to receive a second return cable at an end opposite to that at which it is anchored and to retain said second return cable in close proximity to said first return cable, said positioners serving to maintain said first and second cables in a close relatively parallel relation during the operation of the bow.

4,524,751

PORTABLE COOKING DEVICE

Allen C. Hoglund, 116-261, 3rd St. East, North Vancouver, B.C., Canada

Filed Aug. 20, 1982, Ser. No. 409,876
Int. Cl.³ A47J *37/00*
U.S. Cl. 126—25 A **39 Claims**



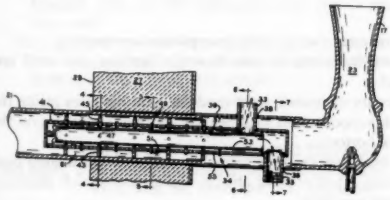
1. A portable cooking device comprising a housing having two concave sections each having an open end and securable to one another in juxtaposition with their open ends facing one another, one of said concave sections having a heat generating element secured therein beneath a heat transmitting support frame, the other of said concave sections having a collapsible wall assembly secured thereto and positionable to an operable vertical position extending above said open end of said other concave section, a combustible product support platform securable internally of said wall assembly when in said operable vertical position to support a combustible product thereon, said wall assembly having at least one angulated reflective wall, and a base wall under said support platform.

4,524,752

RECUPERATOR

Beresford N. Clarke, 3723 W. Hamilton Rd., Fort Wayne, Ind. 46819

Filed Apr. 26, 1983, Ser. No. 488,702
Int. Cl.³ F24C *3/00*; F28D *7/12*; F23D *11/44*; F27B *5/11*
U.S. Cl. 126—91 A **9 Claims**



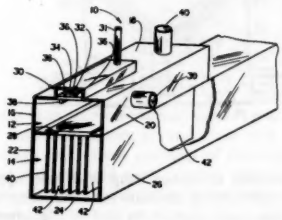
1. In a negative pressure radiant tube type fuel burner system having a closed type burner unit near one tube end for introducing a combustible fuel-air mixture into the tube, an arrangement for recovering heat from exhaust gas emanating from another end of the tube comprising an air intake passageway for supplying air from the atmosphere to the burner unit including a concentric conduit portion extending inwardly into the radiant tube from said other end of the tube to divert intake air along generally parallel coaxial oppositely directed paths into and out of the radiant tube to transfer heat from exhaust gas to intake air and means fixed to the concentric conduit portion at spaced locations therealong for slidingly supporting the conduit portion within the tube in a relatively free floating manner to reduce the likelihood of damage due to temperature differential induced distortions and to facilitate installation, the negative pressure being created within the tube by an eductor assembly connected to said other end of the tube, said concentric conduit portions being disposed upstream from said eductor such that exhaust gas passes thereby prior to entering the eductor assembly.

4,524,753

INFRA-RED HEATING APPARATUS

Daniel Wolf, 9200 Prospect Ave., Louisville, Ky. 40222

Filed Nov. 12, 1982, Ser. No. 440,953
Int. Cl.³ F24C *3/04*
U.S. Cl. 126—99 R **10 Claims**



1. An infra-red heating apparatus, comprising:

an air duct;

a combustion chamber located adjacent said air duct;

a black body receiver adjacent said air duct and said combustion chamber;

a fuel supply plenum chamber adjacent said combustion chamber;

a radiating surface disposed between said fuel supply plenum chamber and said combustion chamber, said radiating surface being spaced from and generally facing said black body receiver;

means for directing fuel along said radiating surface and generally in a direction toward said black body receiver;

ignition means for igniting the fuel at said radiating surface; and,

heat radiating surfaces projecting from said black body receiver into said air duct whereby air passing through said air duct is heated as it passes said heat radiating surfaces.

4,524,754

HEATING APPLIANCE

Elliot V. Schubert, 194 Pleasant Valley St., Methuen, Mass. 01844

Filed Aug. 15, 1983, Ser. No. 523,182
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 R **7 Claims**

1. A heating appliance comprising:

an outer housing including top, bottom, and side walls and forming an inner heat exchange chamber;

an elongated combustion chamber centrally disposed within said heat exchange chamber adjacent said bottom housing wall;

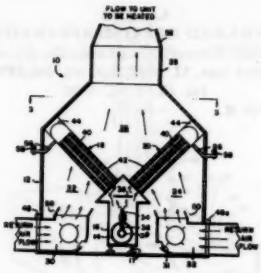
said combustion chamber having chamber walls forming a

lower combustion portion including a burner for the combustion of fuel and an upper combustion portion;

a pair of elongaged heat exchanger units angularly and laterally disposed within said outer housing and upon said upper combustion chamber portion and forming a generally upwardly V configuration within said inner heat exchange chamber whereby said combustion chamber and heat exchangers divide said heat exchange chamber into a pair of lower cool air plenum zones for receiving cool air to be heated and a single upper hot air plenum zone for receiving air heated by each of said heat exchange units, each of said heat exchange units comprising:

a plurality of spaced elongated tubular conduits having lower inlet openings communicating with the upper portion of said combustion chamber through which effluent fuel combustion gases pass;

upper outlet openings;



an exhaust manifold communicating with said upper outlet openings of said tubular conduits for conducting said effluent combustion gases away from said tubular conduits; and

a plurality of elongated heat conducting fin members disposed in spaced vertical array about said tubular conduits from said combustion chamber to said exhaust manifold;

cool air intake openings disposed in said housing sidewalls adjacent each said cool air plenum zone;

blower means disposed adjacent said cool air intake openings to force movement of air into said cool air plenum zones, into contact with the said heat exchanger associated with each said cool air plenum zone, and into the said hot air plenum zone; and

a hot air outlet opening disposed in said top housing wall communicating with said hot air plenum zone for conducting heated air from said heating appliance.

4,524,755

FRICTION HEAT GENERATOR

Harold D. Harris, 5518 Ogden St., Omaha, Nebr. 68104, and Thomas J. Harris, 10636 Ellison Plz. #1, Omaha, Nebr. 68134

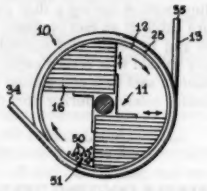
Filed Apr. 5, 1984, Ser. No. 596,967
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 **5 Claims**

1. An improved friction heater apparatus consisting of:

an elongated thin, walled metallic friction drum sealed on both end and having an elongated axle member centrally journaled therein;

an elongated axle spindle element comprising a generally rectangular main body surrounding the axle member and mounted thereto, and having a plurality of leg members projecting outwardly from the corners of the spindle body, wherein the leg members are axially off-set from the spindle body and create a plurality of enlarged support surfaces and a plurality of relatively short support surfaces that generally divide the interior of said drum into axially offset quadrants; and,

a pair of free floating arcurate friction block elements occupying only two of the four axially offset quadrants wherein the pair of friction block elements are offset from one another, and wherein the the unoccupied axially offset quadrants are adapted to receive a mass of detached particles from the



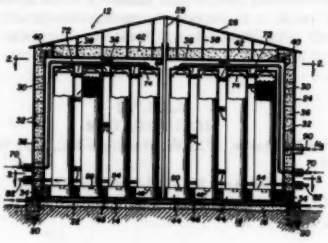
friction block elements, whereby the mass of particles are swept around the interior of the drum by the leading edges of the friction block elements under the influence of centrifugal force imparted to the said pair of friction block elements by the spindle element.

4,524,756

THERMAL ENERGY STORAGE TANK USING MODULAR HEAT BATTERIES

Royce J. Laverman, South Holland, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jul. 25, 1983, Ser. No. 516,593
Int. Cl.³ F24H *7/00*; F28D *17/00*
U.S. Cl. 126—400 **4 Claims**



1. A thermal energy storage apparatus comprising:

a thermally insulated tank having a bottom, side wall and roof;

a plurality of spaced apart modular heat batteries inside the tank supported on load bearing thermal insulation on the tank bottom;

each heat battery constituting an enclosed metal shell containing a bed of solid objects and around which objects a liquid can flow;

conduit means to feed a hot or cold liquid from outside of the tank to the top of each bed in each battery;

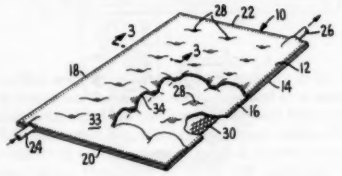
conduit means to withdraw a hot or cold liquid from the bottom of each bed in each battery and deliver it to a destination outside of the tank; and

means to flood the tank with an inert gas.

4,524,757
SOLAR COLLECTOR, HEAT EXCHANGER OR HOT WATER STORAGE TANK AND METHOD OF FORMING SAME

Bruce S. Buckley, 1321 Grizzly Peak, Berkeley, Calif. 94708, assignor to Bruce Shawn Buckley, San Jose, Calif.

Continuation of Ser. No. 258,519, Apr. 28, 1981, abandoned.
This application Dec. 29, 1983, Ser. No. 565,533
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 12 Claims



1. Method of forming a heat exchanger, solar heat collector or storage element having flow passages therethrough which comprises:

bonding a flexible pair of non-metallic sheet members directly to each other at a plurality of discrete areas of similar size and similarly spaced apart with respect to each other, at least one of said sheet members having heat-transfer promoting filaments embedded therein, and said heat-transfer filaments being substantially coextensive with said spaced apart areas for equalization of thermal stresses and for readily transferring heat between the bonded and unbonded portions of said non-metallic sheet n. nbers, and

sealing along at least one pair of parallel opposed edges of said sheet members to form longitudinal flow passages generally parallel to said edge but with free lateral communication of fluid between said sheet members along substantially the entire length of the passages for equalizing fluid temperatures across said panel when the resulting unbonded volume between said sheet members is filled with fluid.

6. An article of manufacture suitable for use as a heat exchanger tank or solar collector in a solar water heating system comprising:

a pair of flexible non-metallic sheet members bonded directly to each other around their peripheral edges and additionally bonded at a plurality of discrete areas of similar size, each area being similarly spaced longitudinally and laterally with respect to each other over the enclosed surface of said sheet members, such that fluid flow is permitted from opposed edges over substantially the entire lateral and longitudinal lengths of the article,

heat conductive filaments for readily transferring heat embedded in one of said sheet members to promote heat transfer and to equalize thermal stresses between said bonded areas and the unbonded areas of said sheet members, and

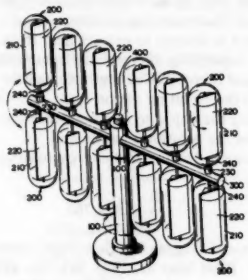
fluid connector means formed adjacent two opposed peripheral edges of said sheet members for admission and withdrawal of fluid from said article.

4,524,758
SOLAR RAY COLLECTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-k□, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,405
Claims priority, application Japan, Jun. 24, 1983, 58-114766
Int. Cl.³ F24J 3/02
U.S. Cl. 126—440 10 Claims

1. A solar ray collecting device for collecting solar rays from the sun, comprising a rotatable support post having a generally vertical axis, a support post motor for rotating said support post about said vertical axis, a rod having a rod axis disposed generally perpendicular to the vertical axis of said support post, said rod having a longitudinal central portion mounted on said support post such that said rod rotates in a generally horizontal plane as said support post motor rotates said support post, a plurality of solar ray collecting elements each rotatable about a generally upright shaft, each of said collecting elements having a drive means for rotating the respective collecting element about the axis of its upright shaft, said plurality of drive means being carried by said rod and being longitudinally spaced along the longitudinal length of said rod, each of said collecting elements including a plurality of light collecting lens means and optical conductors having a light-receiving edge located at the focus of said lens means, each of said upright

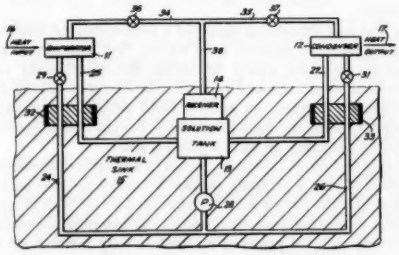


shafts along with said rod and said support post having hollow portions, said conductors passing from said light-receiving edge through the hollow portions of the respective upright shaft, said rod and said support post, whereby each of said drive means is operable to rotate its respective collecting element alternately in both directions while said support post motor rotates said support post alternately in both directions in a manner to preclude the shadow of one collecting element impinging on the lens means on another collecting element as the sun traverses a 360 degree path about the solar ray collecting device while also limiting the maximum twist imparted to said conductors passing through said hollow portions of said upright shaft, said rod and said support post.

4,524,759
PROCESS FOR THE REVERSIBLE TRANSFER OF THERMAL ENERGY AND HEAT TRANSFER SYSTEM USEFUL THEREIN

Robert F. Butler, 18805 Orange Ave., Sonoma, Calif. 95476

Filed Oct. 28, 1983, Ser. No. 546,470
Int. Cl.³ F24J 3/02; F25B 27/00
U.S. Cl. 126—452 21 Claims



1. A process for reversibly transferring heat between a plurality of zones maintained at different temperature levels, including evaporating a solution containing a volatile material

in a first, heated evaporation zone, condensing vapor of the volatile material in a second, condensation zone at a temperature less than that of the evaporation zone, and removing heat from the condensation zone upon condensation of the volatile material vapor therein; comprising:

(a) maintaining the solution in a solution-holding zone;

(b) circulating the solution from the solution-holding zone through the evaporation and/or condensation zones;

(c) feeding the volatile material vapor from the evaporation zone into a separate receiving zone maintained at a lower temperature, and condensing the vapor therein;

(d) providing a low temperature thermal sink in heat exchange relation with the receiving zone;

(e) effecting heat transfer from the receiving zone to the thermal sink upon condensation of the volatile material vapor in the receiving zone;

(f) when it is desired to extract heat from the condensation zone, vaporizing the volatile material in the receiving zone and thereby effecting heat transfer from the thermal sink to the resulting vapor;

(g) feeding the vapor to said condensation zone and absorbing it in the solution therein; and

(h) recovering the thermal energy released during step (g).

4,524,760

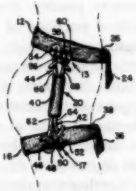
SEXUAL AID

Elaine Lerner, 6 Duggan St., Stoughton, Mass. 02072

Filed May 31, 1983, Ser. No. 499,507

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **2 Claims**



1. Device whereby one partner can exercise control over the movement of the hips of the other partner during the act of sexual intercourse which comprises:

(a) a waist band of a predetermined length of nonextensible material having first and second free ends, fastening means connected to at least one of said free ends for fastening the ends together to form an endless band around a person's waist, said fastening means providing for adjustability of the waist band size, and loop means each having four individual loops located in opposition to one another on said waist band and so located thereon as to be at the wearer's respective sides when the said device is being worn;

(b) first and second leg bands of a predetermined length of nonextensible material each having first and second free ends, fastening means providing for adjustability connected to at least one of each said first and second free ends for forming an endless band around the wearer's upper thigh, and loop means each having four loops each being provided on each leg band; and

(c) first and second gripping means of nonextensible material each having a gripping portion whereby the one partner can grip the device with his hands and a pair of tie connectors extending from each end of the gripping portion for connecting the gripping means to a loop member on the waist band and a loop member on a leg band, said tie connectors being threaded in one direction through the outside loops in the loop means and threaded in the reverse direction through the inner loop and then tied together.

4,524,761

ENDOSCOPE APPARATUS

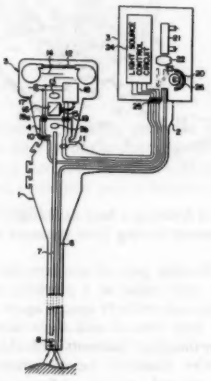
Shinichiro Hattori; Seiichi Hosoda, and Takeshi Takamatsu, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 355,243, Mar. 5, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 580,780

Claims priority, application Japan, Mar. 16, 1981, 56-37662

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. An endoscope apparatus comprising:

an endoscope having a light guide for transmitting observation and photographing lights, an image guide for transmitting light reflected from an object, and an eyepiece section;

a camera detachably arranged at the eyepiece section of said endoscope and having light control signal producing means for producing selectively an observation light control analog signal corresponding to an intensity of light transmitted through the image guide and a photographing light control digital signal for terminating the emission of the photographing light, said light control signal producing means including a photoelectric element, an integrating circuit for integrating an analog signal of said photoelectric element and a comparator for comparing the integration signal of said integrating circuit with a reference signal to produce the photographing light control digital signal; and

a light supply unit including light source means for emitting the observation light and photographing light, observation light control means for automatically controlling an intensity of the observation light of said light source means correspondingly to the observation light control signal applied from said light control signal producing means in said camera, and photographing light control means for controlling a brightness of the photographing light of said light source means correspondingly to the photographing light control signal.

4,524,762

SEAT HAVING MOVABLE SUPPORTING SURFACES

David A. Schulman, 7701 Newton Ave. N., Brooklyn Park, Minn. 55444

Filed May 16, 1983, Ser. No. 494,942

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—33 **12 Claims**

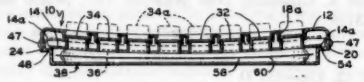
1. A seat for promoting improved blood circulation, posture and comfort comprising

a hollow seat body including a supporting matrix with an

upwardly disposed first support surface for supporting the human body and having a plurality of openings therein,

a second supporting means defined by an array of connected plugs movably mounted in the openings and adapted to slide up and down as a unit through the openings,

said plugs having top surfaces comprising a second support surface adapted to support a surface of the body when elevated to an extended position above the first support



surface and being adapted to permit the body of the user to rest upon the matrix when lowered to a retracted position with their top surfaces below said first surface,

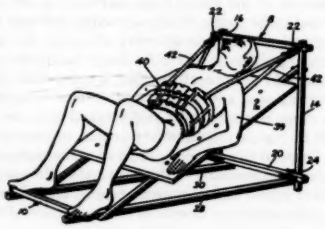
a fluid inflatable flexible bag mounted within the seat and connected to the plugs in motion transmitting operative association therewith to move the connected plugs as a unit when inflated to one of said positions and allowing the plugs to move together as a unit to the other of said positions when deflated.

4,524,763

PORTABLE GRAVITY ASSISTED LUMBAR TRACTION DEVICE

Ernest W. Eberling, Jr., 1872 Hybiscus St., Medford, Oreg. 97501

Filed Jul. 13, 1982, Ser. No. 397,797
Int. Cl.³ A68H *1/02*
U.S. Cl. 128—75 **1 Claim**



1. A therapeutic apparatus for use in gravity assisted lumbar spine traction treatments and including a body harness adapted to connect to the patient's body above the lumbar spine area, comprising

first and second support frames for the apparatus connectable so that the frames are in substantially 90° angular relation to each other,

a support board having a patient body support surface thereon,

elongated support members carrying the support board and secured to the first and second support frames to form a triangle therewith as seen in side elevational view so that the support board and the body support surface lie within the hypotenuse of said triangle,

at least one of said first and second support frames having body harness connection means thereon,

said harness having means to connect to the connection means whereby same is adapted to accomodate the gravity hang of only the torso of the patient's body on the support surface,

foot support means adjacent the apparatus,

said foot support means and the apparatus being positioned relative to each other whereby the patient may maintain his thighs in a determined angular relation to the body support surface and may controlably vary the angular relation between the thighs and the body support surface through ninty degrees and thereby enhance the therapeutic effect of the lumbar spine traction,

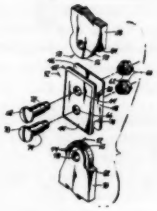
and said support board being dimensioned to provide body torso surface support from the patient's head to the patient's pelvic area and providing no support for the patient's thighs and lower legs whereby the patient's body is so hung by the apparatus that the distance from the patient's pelvic area to the foot support means along the hypotenuse is always substantially less than the patient's inseam.

4,524,764

KNEE BRACE

Harold E. Miller, R.R. 1, Box 185, West Branch, Iowa 52358, and Ronald W. Cheney, 2004 Center St., West Des Moines, Iowa 50265

Filed Sep. 6, 1983, Ser. No. 529,261
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **8 Claims**



1. A knee brace for supporting a human leg having a knee, an upper leg portion above said knee, and a lower leg portion below said knee; said knee and said upper and lower leg portions each having an anterior surface, a posterior surface, a medial surface, and a lateral surface, said brace comprising:

a medial articulated assembly and a lateral articulated assembly adapted to embrace said medial and lateral surfaces of said knee therebetween;

each of said articulated assemblies comprising an upper member having upper and lower ends, a lower member having upper and lower ends, and hinge means pivotally interconnecting said upper end of said lower member to said lower end of said upper member;

each of said hinge means comprising a pair of spaced apart strap plates held in rigid spaced apart relation to one another by web means;

said upper ends of said lower members and said lower ends of said upper members extending between and being embraced by said spaced apart strap plates;

each of said hinge means including a pair of spaced apart hinge pins extending through said spaced apart strap plates, one of said pins extending through said lower end of said upper member and the other of said hinge pins extending through said upper end of said lower member to provide first and second hinged axes for said upper and lower members respectively;

said lower ends of said upper members and said upper ends of said lower members each being provided with an arcuate gear surface concentric to said first and second hinge axes respectively, said gear surfaces each including gear teeth and flange means formed adjacent said gear teeth;

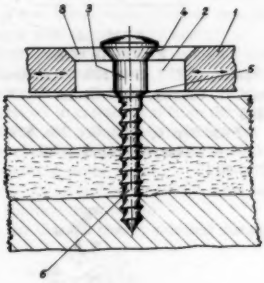
said gear teeth of said lower members intermeshing with said gear teeth of said upper members between said spaced apart strap plates whereby said intermeshing gear teeth, said flange means, said hinge pins, said spaced apart strap plates, and said web means combine to resist breaking of said hinge means in response to outside impact forces being applied to said knee.

4,524,765

FUNCTIONAL ATTACHMENT SYSTEM FOR OSTEOSYNTHESIS BY MEANS OF COMPRESSION PLATES

Juan L. de Zbikowski, Virgen de la Antigua, 10-1º , Sevilla, Spain

Filed Dec. 9, 1982, Ser. No. 448,329
Claims priority, application Spain, Dec. 9, 1981, 507.800
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 D 5 Claims



1. A functional attachment system for biocompressive osteosynthesis for connecting bone portions on either side of a fracture site of a fractured bone comprising:

(a) a plate having a major zxis adapted to be oriented generally parallel to a major axis of the fractured bone, said plate having end portions adapted to be positioned on either side of said fracture site respectively, each of said end portions having holes elongated in a direction generally parallel to the major axis of said plate; and

(b) means attached to the bone portions for capturing said plate end portions with respect to the bone portions through said elongated holes, so as to allow relative displacement between each bone portion and said plate generally paallel to said plate major axis in response to biocompressive forces.

4,524,766

SURGICAL KNEE ALIGNMENT METHOD AND SYSTEM

Thomas D. Petersen, 9680 Alto Dr., La Mesa, Calif. 92041

Filed Jan. 7, 1982, Ser. No. 337,587
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 H 50 Claims

1. A system of instruments for assisting in performing knee replacement surgery, comprising;

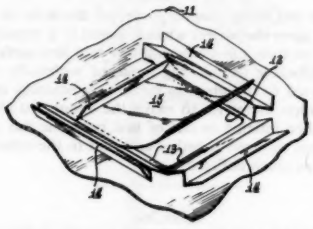
a cutting guide for guiding an instrument for cutting a knee joint surface; and means for precisely aligning said cutting guide with respect to the true weight bearing axis of the leg in which the knee is to be replaced, comprising an extensible member having said cutting guide attached at one end thereof; and an adjustable ankle means at the other end of said body member having means engaging the ankle.

4,524,767

SURGICAL DRAPES

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Filed Jul. 6, 1982, Ser. No. 395,803
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—132 D 5 Claims



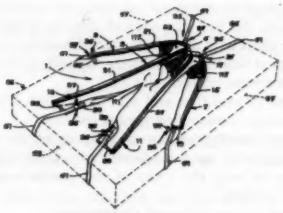
1. A surgical drape comprising a main drape having a multiple sided operative opening adapted to be arranged over the surgical area of a patient, a number of absorbent accordion folded flaps integrally attached to the main drape along one of their marginal edges one outwardly of each peripheral margin of the operative opening, an incise drape being sized and shaped to lie over the operative opening and areas of the main drape inwardly of the folded flaps surrounding the operative opening, said incise drape having one edge attached to one of said peripheral margins, an adhesive covering the surface of the unsecured portion of said incise drape facing the operative opening and said peripheral margins, a removable sheet normally covering said adhesive coated surface whereby when said main drape is placed over said surgical area, said sheet is removable to expose the adhesivly coated surface and enable the incise drape to be adhesively secured to the remaining areas of the main drape inwardly of the flaps and to the surgical area of the patient within said operative opening, and said absorbent flaps being extendable to overlie at least a portion of the incise drape disposed over the operative opening.

4,524,768

RESTRAINT GARMENT

Charles A. Serrao, Montreal, Canada, assignor to Giovanni Argentino, Verdun, Canada

Filed Sep. 21, 1983, Ser. No. 534,294
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—134 7 Claims



1. A restraint garment for securely, yet confortably, immobilize a patient in laid down position on a bed, said garment comprising:

a torso enclosing portion with a top edge defining a neck opening;

two arm enclosing portions and two leg enclosing portions integral with the torso enclosing portion and extending thereform to terminate in free ends, said arm enclosing portions being made longer than the normal length of an arm;

closure means in the garment for providing access into it; and

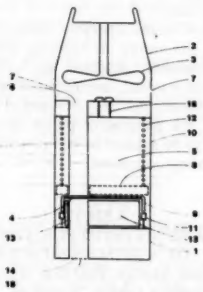
restraint means on the garment for attaching it into the a bed in view of substantially immobilizing a patient within the garment on said bed, said restraint means comprising a plurality of first restraint members respectively fixed to the garment on each side of the neck opening and at the free end of each arm and leg enclosing portion, said first restraint members being detachably connectable to a similar number of second restraint members mounted at the end of straps fixed to the bed in such a manner as to substantially immobilize said garment and the patient therein in laid down position on said bed.

4,524,769

DOSAGE INHALATOR

Kjell I. L. Wetterlin, S Sandby, Sweden, assignor to Aktiebolaget Draco, Lund, Sweden

Filed Jun. 17, 1982, Ser. No. 389,213
Claims priority, application Sweden, Jul. 8, 1981, 8104239
Int. Cl.³ A61M *15/00*
U.S. Cl. 128—203.15 **12 Claims**



1. A dosage inhalator for dispensing to a patient a micronized solid, pharmacologically active compound in dry powdered form having a particle size of less than 5 micrometers suspended in a gas, comprising:

a nozzle;

a conduit connected to the nozzle;

a storage chamber adjacent said conduit for storing said active compound to be dispensed by said inhalator;

a perforated membrane having a plurality of preselected perforated portions each holding and dispensing a reproducible unit dose of less than 50 mg. of said micronized compound, said membrane being mounted for movement between said conduit and said storage chamber so that one of said preselected portions is positioned across said conduit whereby the active compound held in the perforation thereof can be dispensed into the conduit and another of said preselected portions thereof is disposed within said storage chamber;

dose loading means for introducing said active compound in the storage chamber into the perforation of the preselected portion of said membrane disposed within the storage chamber; and

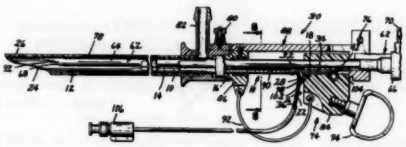
maneuvering means for displacing the perforated membrane through a plurality of positions whereby successive preselected portions of the perforated membrane holding the active compound are positioned across said conduit for dispensing the active compound.

4,524,770

ENDOSCOPE INJECTION NEEDLE

Ahmad Orandi, Rte. 6, Box 138A, Fergus Falls, Minn. 56537

Filed Jan. 25, 1983, Ser. No. 460,873
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.1 **2 Claims**



1. A tool for use with an endoscopic instrument for applying fluid from forcing means, said instrument having an eyepiece at a proximal end and a sheath at a distal end, said instrument further including a working element with a body and a header, said body being guidably movable toward and away from said header, said sheath and said header including passages for receiving said tool, said body including clamping means for holding a portion of said tool, said tool comprising:

a hollow needle with a tip and an opposite end portion, said needle for projecting partially from the sheath of said endoscopic instrument when said body of said instrument is moved toward said header;

extending means for being received by the clamping means of the body of said instrument, said extending means being connected to said needle;

flexible conduit means for directing fluid from the fluid forcing means to an end portion positioned for fluid communication with said needle; and

means for encasing the end portions of said conduit means and said needle, said encasing means extending from the end portion of said needle when it projects partially from the sheath of said instrument to between said body and said header, said extending means extending beyond said encasing means to the clamping means of the body, said encasing means including means for providing said conduit means to be bent between said header and said body so that said conduit means may be directed away from said instrument;

whereby said flexible conduit means may be directed from between said header and said body away from said instrument to said forcing means thereby providing fluid communication from said forcing means to said needle, through said conduit means and said encasing means, while providing operable connection at said extending means between said tool and said instrument.

4,524,771

MULTIPLE CURVED SURGICAL NEEDLE

Richard C. Troutman, New York, N.Y., and Walter McGregar, Fleming, N.J., assignors to Ethicon Inc., Somerville, N.J., a part interest

Filed Oct. 28, 1982, Ser. No. 437,419
Int. Cl.³ A61B *17/06*
U.S. Cl. 128—339 **11 Claims**

1. A surgical needle comprising a multiple curved body portion terminating in a blunt end and a stra-ght point end, all curves of the multiple curves being concave, the curve adjacent the pointed end of the needle having a radius of curvature of from 0.040 inch to 0.075 inch and a length of curvature of from 0.063 inch to 0.105 inch, and the curve adjacent the blunt end of the needle having a radius of curvature of from 0.080 inch to 0.120 inch and a length of curvature of from 0.081 inch

to 0.115 inch the axis of said straight point end intersecting at an angle the concavity of said concave curve adjacent said straight point end whereby the straight point provides a controlled depth during the placement of the needle, the tighter

initial curve provides the desired turnaround of the needle when the needle is placed and the gentler curved portion provides ease of gripping of the needle and control of the needle during placement.

4,524,772

APPARATUS FOR HAIR REMOVAL

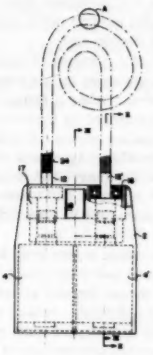
Yair Daar, Moshav Galia, and Shimon Yahav, 11 Moshe Mizrachi St., Rehovot, both of Israel

Filed Jul. 22, 1983, Ser. No. 516,699

Claims priority, application Israel, Aug. 20, 1982, 66595; Jun. 15, 1983, 68990

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—355 **30 Claims**



1. An electrically powered depilatory device comprising:
a hand held portable housing;
motor means disposed in said housing; and
a helical spring comprising a plurality of adjacent windings arranged to be driven by said motor means in rotational sliding motion relative to skin bearing hair to be removed, said helical spring including an arcuate hair engaging portion arranged to define a convex side whereat the windings are spread apart, and a concave side corresponding thereto whereat the windings are pressed together, the rotational motion of the helical spring producing continuous motion of the windings from a spread apart orientation at the convex side to a pressed together orientation at the concave side and for engagement and plucking of hair from the skin of the subject, whereby the surface velocities of the windings relative to the skin greatly exceeds the surface velocity of the housing relative thereto.

4,524,773

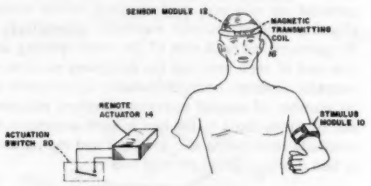
APPARATUS FOR INHIBITING SELF-INJURIOUS BEHAVIOR (SIB) IN PATIENTS

Robert E. Fischell, Silver Spring; Arnold L. Newman; Henry B. Riblet, both of Kensington, and William R. Powell, Columbia, all of Md., assignors to The John Hopkins University, Baltimore, Md.

Filed Aug. 24, 1983, Ser. No. 843,944

Int. Cl.³ A61N *1/38*

U.S. Cl. 128—419 S **18 Claims**



1. An apparatus for inhibiting self-injurious behavior, comprising:
an actuator means for generating a modulated near field magnetic signal in response to a patient's self-injurious behavior, said modulated near field magnetic signal being modulated with coded information identifying said patient; and
a stimulus module, adapted to be worn on said patient's body, including:
a receiver means for receiving said modulated near field magnetic signal and for detecting and processing said coded information;
a digital control means, operably connected to said receiver means, for generating an enabling command when said coded information detected by said receiver means matches with a stored identification code; and,
a stimulation means, operably connected to said digital control means, for generating pulses of aversive electrical stimulation to be applied to said patient's skin, in response to said enabling command.

4,524,774

APPARATUS AND METHOD FOR THE STIMULATION OF A HUMAN MUSCLE

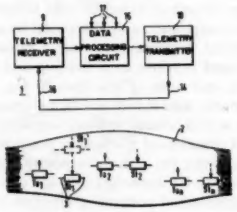
Jürgen Hildebrandt, Munich, Fed. Rep. of Germany, assignor to Deutsche Nemectron GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,283

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130104

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—421 **28 Claims**



1. Apparatus for stimulating a muscle, comprising:
(a) first means for stimulating said muscle, said first means being adapted to receive muscle stimulation signals from third means and to stimulate one region of said muscle accordingly;
(b) second means for receiving muscle stimulation signals

directly from another region of said muscle and transmitting said muscle stimulation signals to said third means; and

(c) third means adapted to receive said muscle stimulation signals and to re-transmit said muscle stimulation signals to said means for stimulating said muscle.

4,524,775

MEDICAL ELECTRODE AND A METHOD OF MANUFACTURING SAME

Jan Rasmussen, Bogevej 12, DK-3650 Olstykke, Denmark

Filed Feb. 14, 1983, Ser. No. 466,164
Claims priority, application Denmark, Feb. 15, 1982, 647/82
Int. Cl.³ A61B 5/04
U.S. Cl. 128—640 **10 Claims**

1. A medical electrode comprising:

a foamed plastic disc having first and second sides with an aperture extending therebetween and forming a contact medium chamber, said foamed plastic disc comprising a plurality of cells with walls, said walls of said cells surrounding and adjoining said chamber being compressed and at least partially fused;

a plastic foil cover covering said aperture and at least a part of said foamed plastic disc surrounding said aperture on one of said sides of said disc;

connector means adapted to be electrically connected to monitoring equipment;

a metal electrode disposed in said chamber and electrically connected to said connector means; and

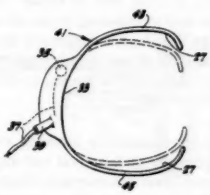
a layer of pressure-sensitive adhesive applied to the other of said sides of said disc.

4,524,776

SPLIT CARRIER FOR EYELID SENSOR AND THE LIKE

Stanley J. Withers, 4701 San Leandro St., Oakland, Calif. 94601; Gary E. Schneiderman, 640 Mandarin La., Walnut Creek, Calif. 94598, and William M. Little, Jr., 1059 Norwood Ave., Oakland, Calif. 94610

Filed Oct. 27, 1983, Ser. No. 545,908
Int. Cl.³ A61B 5/04
U.S. Cl. 128—644 **13 Claims**



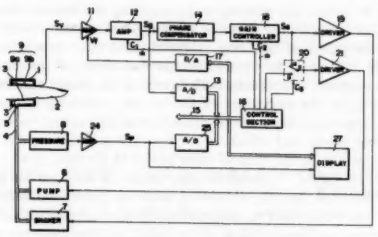
1. An eyelid device carrier comprising a split, resilient ring having upper and lower legs adapted to be received between the eyeball and the eyelids and defining an opening allowing substantial movement of the eyeball with minimal contact between the cornea and the ring, the vertical distance between said upper and lower legs, with the split resilient ring in relaxed position, being greater than the vertical distance between the inferior and superior conjunctival fornices of the eye whereby the split ends of said ring are adapted to resiliently hold the carrier in position in the eye by being resiliently urged apart and into the conjunctival fornices, at least one device in said ring having a portion exposed for contact with the eye, said ring including a first portion of relatively small cross-section and a second portion of relatively wide cross-section, said device being disposed in said second portion.

4,524,777

AUTOMATIC, CONTINUOUS AND INDIRECT BLOOD PRESSURE MEASUREMENT APPARATUS

Kazuya Kisioka, Tomisatomura, and Kenichi Yamakoshi, Sapporo, both of Japan, assignors to Ueda Electronic Works Limited, Japan

Filed May 5, 1983, Ser. No. 491,984
Claims priority, application Japan, Feb. 25, 1983, 58-30500
Int. Cl.³ A61B 5/02
U.S. Cl. 128—677 **2 Claims**



1. In an automatic, continuous and indirect blood pressure measurement apparatus comprising:

(a) a cuff which is adapted to be attached to a segment to be measured;

(b) external force applying means for applying an external force to fluid contained in said cuff to thereby generate a cuff pressure;

(c) a pressure sensor means for measuring said cuff pressure; and

(d) a volume sensor means for detecting a volume per unit length of an artery of said segment, said volume varying in accordance with said cuff pressure and a pulsating intravascular pressure, said volume sensor means generating a volume signal corresponding to said volume, said volume signal comprising a DC component and a volumetric pulse signal, wherein said external force applying means is energized in accordance with said volumetric pulse signal shifted in phase and controlled in amplitude in order to control and maintain said volume per unit length constant and to obtain an instantaneous blood pressure of said artery as a function of said cuff pressure;

the improvement which comprises:

DC level adjustment and first gain control means which is supplied with an output from said volume sensor means, said output being subjected to DC level adjustment and amplitude control, said DC level adjustment and first gain control means generating a DC level adjusted and amplitude controlled volume signal;

phase compensator and second gain control means which controls the phase and amplitude of said volume signal from said DC level adjustment and first gain control means to generate said phase shifted and amplitude controlled volumetric pulse signal; and

driver means responsive to said volumetric pulse signal shifted in phase and controlled in amplitude for driving said external force applying means.

4,524,778

SKIN TEMPERATURE INDICATING AND RECORDING DEVICE

George T. Brown, Jr., Dayton, and Lewis E. Blakely, Jr., Kettering, both of Ohio, assignors to American Thermometer Co., Inc., Dayton, Ohio

Filed Jul. 1, 1983, Ser. No. 509,933
Int. Cl.³ A61B *6/10*
U.S. Cl. 128—736 **8 Claims**

1. A device for sensing and recording the skin surface temperature in selected areas of a human body, comprising a first flexible panel of film-like material, said first panel having a width sufficient to extend across the chest of the body for covering and contacting both breast of the body and for conforming to the curvature of the breast, a coating of temperature responsive liquid crystalline marterials carried by said first flexible panel and effective to produce a thermogram of the skin surface in the area of both breast in thermal contact with said first panel, a second flexible panel of transparent plastics film material directly overlying said first panel and contacting said first panel, said second panel also having a width sufficient to extend across the chest of the body, the thermogram on said first panel being visually observable through said second panel in contact with said first panel, marker means for recording on said second panel a selected pattern detail of the underlying thermogram on said first panel in contact with said second panel, means for attaching said second panel to the body in the area to be examined, means for supporting said first panel between the skin surface and said second panel, said latter supporting means providing for removing said first panel without removing said second panel, an elongated flexible thermometer band adapted to be positioned between the skin surface and said second panel after said first panel is removed, and said thermometer band having opposite end portions projecting above and below said second panel to facilitate gripping said thermometer band and precisely positioning said thermometer band between the skin surface and said second panel whereby temperatures from the thermometer band can be recorded on the second panel.

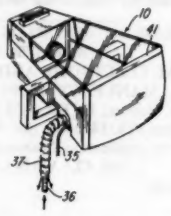
4,524,779

DEVICE FOR DETECTING, MEASURING, AND RECORDING BODY THERMAL EMISSIVITY

George T. Brown, Jr., Dayton, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio

Filed Jul. 20, 1983, Ser. No. 515,503
Int. Cl.³ G03B *29/00*
U.S. Cl. 128—736 **17 Claims**

1. A device for detecting and recording the thermal emissivity of a body, comprising a substantially rigid housing having opposite forward and rearward end portions, a flexible thermal responsive screen adapted to conform to the contour of the body and having a coating of liquid crystals effective to transform thermal differentials emanating from the body to visible color patterns, means for mounting said screen on said forward end portion of said housing, a camera for recording the image of the patterns, means for closing said rearward end portion of said housing and for supporting said camera, said closing means cooperating with said housing and said screen and screen mounting means to define an enclosed air confining chamber, said housing having transparent wall means providing for viewing the color patterns on said screen prior to recording the image of the patterns with said camera, said chamber having air inlet and outlet means, and means for



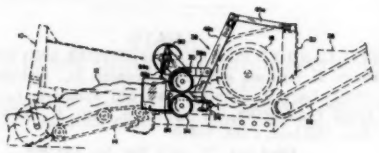
supplying a continuous flow of air to said chamber through said inlet and outlet means and against said flexible screen to aid in conforming said screen to the contour of the body and in controlling the normal temperature of said screen.

4,524,780

COMBINE ATTACHMENT FOR HARVESTING RADISH SEEDS AND THE LIKE

Henry Warkentin, Lebanon, Oreg., assignor to Agriculture Service Corporation, Salem, Oreg.

Filed Sep. 19, 1983, Ser. No. 533,122
Int. Cl.³ A01F *12/10, 11/04*; A01D *45/00*
U.S. Cl. 130—30 G **11 Claims**



1. In a harvesting combine having a pick-up belt, an auger downstream of the pick-up belt, a feeder conveyor downstream of the auger and a threshing means downstream of the feeder conveyor, an attachment mountable to a forward portion of the combine to facilitate the harvesting of radish seeds or the like from a crop windrow having seed-containing pods comprising:

a frame;

fastening means for detachably securing the frame to the combine between the pick-up belt and auger;

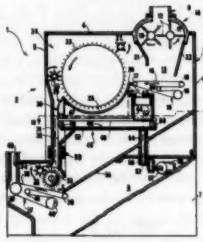
a pair of upper and lower transverse hulling rolls carried by the frame and spaced vertically a distance sufficient to split seed-containing pods conveyed between the rolls without crushing the seeds; and

fluid drive means for driving the rolls in a counter-rotating manner such that the rolls receive all the material comprising the crop windrow from the pick-up belt, convey all of such material therebetween to effect splitting of the pods and then feed all of such material to the auger for conveyance downstream to the feeder conveyor and thence to the threshing means, where the seeds are separated from the split pods.

4,524,781
CIGARETTE-MAKING MACHINE WITH AN AUXILIARY TOBACCO SUPPLY UNIT

Enzo Seragnoli, Bologna, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed Aug. 6, 1982, Ser. No. 406,031
Claims priority, application Italy, Sep. 24, 1981, 49365 A/81
Int. Cl.³ A24C 5/39
U.S. Cl. 131—108 7 Claims

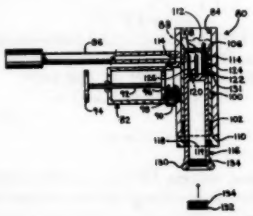


1. A cigarette-making machine comprising:
a main tobacco supply unit (24);
a descending chimney (30) for shredded tobacco, said descending chimney (30) extending downwards from said main tobacco supply unit (24);
an intermediate lateral aperture (47) provided in said chimney (30);
an auxiliary tobacco supply unit (45) communicating with said chimney (30) and comprising a shredded tobacco output conveyor (46) having an outlet end arranged at said aperture (47) and movable thereacross transversely of said chimney (30) to sweep a transverse section of the same; and
actuator means (58) connected to said output conveyor (46) to impart said transverse movement thereto.

4,524,782
TOBACCO SMOKING PIPE HAVING SELF-CONTAINED CLEANING ASSEMBLY

René Chister, 20702-177 El Toto Rd., El Toro, Calif. 92630

Continuation-in-part of Ser. No. 431,470, Sep. 30, 1982, Pat. No. 4,478,228. This application Feb. 7, 1983, Ser. No. 464,457
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.³ A24F 3/02
U.S. Cl. 131—180 9 Claims

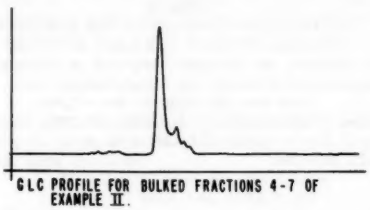


1. A tobacco smoking pipe having a hollow smoking chamber for receiving a plug of tobacco to be smoked and a pipe stem interconnected with said smoking chamber so that tobacco smoke can be drawn therethrough to the mouth of the smoker, said pipe comprising:
tobacco magazine means communicating with said smoking chamber for storing a supply of tobacco to be smoked,
means by which to move an amount of tobacco from the supply thereof in said magazine into said smoking chamber,
tobacco cutting and transporting means being of hollow construction and having a cutting surface formed at an end thereof, said cutting and transporting means being dimensioned to travel through said smoking chamber in order to cause said cutting end surface to cut off a plug of tobacco that has been moved from said magazine into said cutting chamber, said cutting end surface having at least first and second smoke intake ports extending therethrough through which tobacco smoke can be drawn, and
cleaning means located at the hollow interior of said tobacco cutting and transporting means and dimensioned to be moved therethrough,
said cleaning means including at least one elongated cleaning pin and at least one elongated guide pin, said guide pin extending in substantially parallel alignment with and having a length which is longer than said cleaning pin,
said guide pin being of sufficient length to be received through a first of said smoke intake ports at the cutting end surface of said cutting and transporting means for aligning said cleaning pin for receipt by said second smoke intake port, and
said cleaning pin being forced through said second smoke intake port to remove tobacco residue therein when said cleaning means is moved through said cutting and transporting means in a direction towards the cutting end surface thereof.

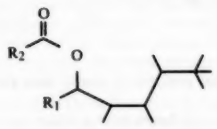
4,524,783
ALKANOIC ACID ESTERS OF 3,4,5,6,6-PENTAMETHYL HEPTANOL-2 AND ALKYL HOMOLOGUES THEREOF; PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Wilhelmus J. Wiegers, Red Bank; Ronald S. Fenn, New Providence; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 541,261, Oct. 12, 1983, abandoned, which is a division of Ser. No. 405,611, Aug. 5, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 589,498
Int. Cl.³ A24B 3/14
U.S. Cl. 131—276 7 Claims



1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobaccos and smoking tobacco articles comprising the step of intimately admixing with a smoking tobacco composition or at least one element of a smoking tobacco article, an aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_1 is C_1–C_3 alkyl and R_2 is hydrogen or C_1–C_3 alkyl.

4,524,784

DEVICE FOR FORMING PERFORATIONS IN BAR-SHAPE ARTICLES

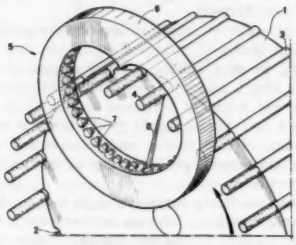
Enzo Seragnoli, and Armando Neri, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Mar. 22, 1983, Ser. No. 477,605

Claims priority, application Italy, Apr. 13, 1982, 48220 A/82

Int. Cl.³ A24C *5/60*

U.S. Cl. 131—281 **1 Claim**



1. A device for forming perforations in bar-like articles, in particular cigarettes, characterized by the fact that it comprises a piercing station (5) traversed by the said articles (3) to be pierced and including a plurality of laser diodes (7) and a fixed support (6-15) for the said diodes (7); these latter each being operable to emit a beam (8) of focused and impulsed laser rays, and being distributed on the said support (6-15) in such a way that the distance between each said diode (7) and the associated perforation on each said article (3) is, at the instant of emission of the associated beam of rays, identical to the focal length thereof, said laser diodes (7) disposed on the said support in succession along a curve (13) of the cardioid type, and the said articles (3) are supported by a conveyor (1) for moving them with a uniform motion through the said piercing station (5) in a direction contrary to that in which the said laser diodes (7) are activated in succession with the said sequence of activation.

4,524,785

METHOD AND APPARATUS FOR FORMING PERFORATIONS IN BAR-LIKE ARTICLES

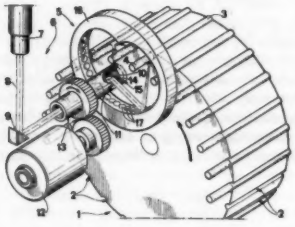
Enzo Seragnoli, and Armando Neri, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Mar. 22, 1983, Ser. No. 477,606

Claims priority, application Italy, Apr. 13, 1982, 48221 A/82

Int. Cl.³ A24C *5/60*

U.S. Cl. 131—281 **8 Claims**



1. A method for perforating bar-shaped articles, including the steps of:

(a) directing a laser beam onto a rotary reflector,

(b) deflecting said beam so as to make it impinge in succession onto each one of a plurality of stationary reflectors distributed along an annular support,

(c) arranging each said stationary reflector so as to reflect an impinging laser beam onto a respective focusing point along a respective point of a line segment, and

(d) advancing by means of a conveyer the articles to be pierced in succesion along a path, a portion of which coincides with said line segment.

6. A device for forming perforations in bar-shaped articles, in particular cigarettes, comprising:

(a) a piercing station for articles and a conveyer for causing the articles to be pierced to move in succession through the piercing station, the piercing station including a plurality of laser emitters each successively operable to emit beams of focused laser rays with a predetermined focusing length, and a support element for the emitters which are distributed thereon along at least one curve formed in such a way as to maintain the length of a path followed by each beam of laser rays between the emitter and the associated piercing point on the article to be pierced maintained constantly equal to the focusing length, the laser emitters being reflector elements selectively impinged on by a beam of laser rays emitted by a rotary reflector laser generator operable to successively deflect the beam onto each reflector element fixed on the support to reflect the beam on the articles to be pierced.

4,524,786

CONTINUOUS PROCESS FOR MICROBIAL DEGRADATION OF TOBACCO CONSTITUENTS CONTAINING NITRATES

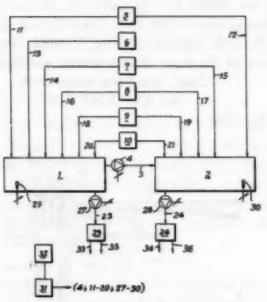
Helmut Gaisch, Cormondreche, and Dieter Schulthess, Neuchatel, both of Switzerland, assignors to Fabriques De Tabac Reunies S.A., Neuchatel, Switzerland

Filed Sep. 9, 1982, Ser. No. 416,769

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136299

Int. Cl.³ A24B *15/20*

U.S. Cl. 131—308 **11 Claims**



1. A continuous process for the microbial degradation of tobacco constituents containing nitrates, nitrites and ammonium ions, wherein fresh aqueous tobacco extract is added continuously to a first fermenter in which exponential growth conditions for the micro-organisms are maintained, and treated extract is continuously removed, characterized in that excess carbohydrate taken up by the biomass removed with the treated extract is used in a second fermenter for the degradation of a further extract of tobacco constituents with the biomass in its stationary phase, the stationary condition being maintained by addition of salts, where necessary, by continuous aeration and by regulating the pH and temperature.

4,524,787
HAIR RELAXER

Ezzat N. Khalil, Oak Park, and Ernest Cheslow, Glencoe, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Filed Jul. 20, 1982, Ser. No. 398,691
Int. Cl.³ A45D *7/00*
U.S. Cl. 132—7 **31 Claims**

1. A hair relaxer system in at least two packages comprising:

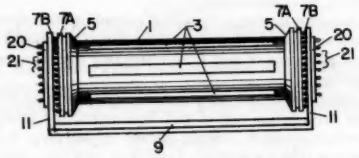
(a) a first package containing a substantially water-free activator that includes a hydrolyzable organic base having a pK_a value of at least 12 that is dissolved in an organic solvent, said organic base being present in free base form in an amount of at least 0.05 moles, sufficient to relax hair and in molar-excess over free and combined water of at least 70 mole percent, said organic solvent being immiscible with petrolatum at a temperature of 25° C.; and

(b) a second package containing water; the contents of said first and second packages when admixed forming a relaxer composition having a pH value of at least 12, and containing at least 20 weight percent water.

4,524,788
HAIR ROLLER

Donald D. Pauldine, 359 W. Church St., Elmira, N.Y. 14901

Filed Jan. 10, 1984, Ser. No. 578,825
Int. Cl.³ A45D *2/14*
U.S. Cl. 132—42 R **8 Claims**

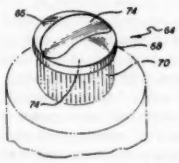


1. A hair roller comprising a cylindrical member having a cylindrical body upon which the hair is wound and end surfaces at the ends thereof; and an elongated strap member, having a center portion substantially the same length as the longitudinal axis of the cylindrical member with a width substantially equal to the diameter of the cylindrical member and end portions at each end of the strap member, which end portions may be folded at substantially right angles to the center portion; the end surfaces of said cylindrical member and the end portions of said strap member each being provided with mating surfaces of self-adhering material, whereby the strap member may be affixed to the cylindrical member at each end.

4,524,789
FINGER REST FOR MANICURING

Elizabeth Sazdanoff, 443 Gerald Ave., Mansfield, Ohio 44903

Filed Sep. 27, 1982, Ser. No. 424,146
Int. Cl.³ A45D *29/00*
U.S. Cl. 132—73 **2 Claims**

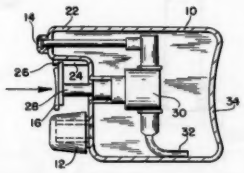


1. A finger rest for stabilizing and elevating a finger during manicuring, said finger rest comprising closure means for covering and sealing the opening of a nail care product bottle having a generally planar base, said closure means having opposed top and bottom surfaces and an interior surface, said bottom surface receiving said bottle opening, said interior surface frictionally engaging the bottle to seal the opening, and said top surface having at least one concave groove oriented generally parallel to the planar base for receiving a finger.

4,524,790
DEVICE FOR CLEANING TEETH AND ORTHODONTAL BRACES

Robert E. Kelley, 166 Cross St., Gardner, Mass. 01440, and David Prince, 638 Lancaster Rd., Leominster, Mass. 01453

Filed Sep. 26, 1983, Ser. No. 535,561
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 R **1 Claim**



1. A device for cleaning particles of food from teeth or orthodonture devices comprising a generally flat hollow housing adapted to contain fluid material,

said housing being substantially square shaped and including two rigid walls with four contiguous edges, three of said edges all being completely closed, the fourth edge mounting a nozzle for a pump and a thumb manipulated operator for the pump which extend outwardly of the housing, and a filling opening and a filling cap, said nozzle, cap and operator being located closely together in a single line with the thumb manipulated operator between the nozzle and the filling cap,

said filling cap, operator, and nozzle all extending from the housing at a single edge thereof approximately equally so that their outermost ends are substantially flush so that some of the fingers can engage the opposite edge of the housing to hold it and the user's thumb can operate the pump operator.

4,524,791
BRAKE FOR AWNING ASSEMBLY

Bradley G. Greer, Irvine, Calif., assignor to A & E Systems, Inc., Santa Ana, Calif.

Filed Jan. 20, 1984, Ser. No. 572,404
Int. Cl.³ B60T *1/02*; E06B *9/208*
U.S. Cl. 135—89 **13 Claims**

1. In combination for use on a recreational vehicle,

a roller,

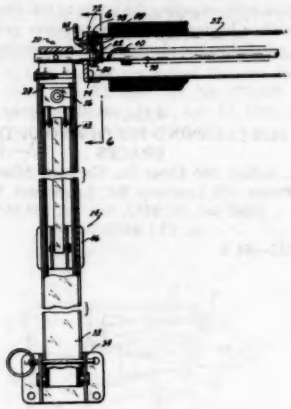
an awning having first and second opposite ends and attached at one end to the recreational vehicle and attached at the second end to the roller,

a hollow cap rotatable with the roller,

a brake member disposed within the cap and coupled to the cap for rotation with the roller, and

an eccentric coupled to the cap for rotation with the cap and rotatable relative to the cap in two opposite directions for engagement with the brake member after rotation in each of the two opposite directions to provide for an unwinding of the awning from the roller, and to inhibit a winding of the awning on the roller, with the engagement between the eccentric and the brake member after the rotation of the eccentric in the first direction and to provide for a

winding of the awning on the roller, and to inhibit an unwinding of the awning from the roller, with the engagement between the eccentric and the brake member after the rotation of the eccentric in the second direction.

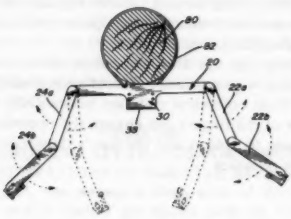


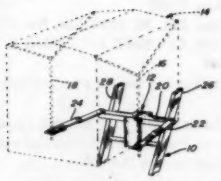
4,524,792

TENT BRACKET

George Tzabanakis, Montreal, Canada, assignor to Les Ateliers Mecaniques Alexandre, Inc., Montreal, Canada

Filed Jul. 11, 1983, Ser. No. 512,711
Int. Cl.³ A45F *1/06*
U.S. Cl. 135—90 **15 Claims**





1. A bracket for securing the struts of a tent structure to a substantially vertical supporting structure, comprising:

a horizontal frame having a central portion and opposite extremities;

means provided at the central portion for securing said horizontal frame to said supporting structure;

a pair of arms each having one end rotatably mounted to a respective opposite extremity of said horizontal frame and the other end adapted to detachably clamp a strut of said tent, each said arm being angularly adjustable in a horizontal plane relative to said horizontal frame; and

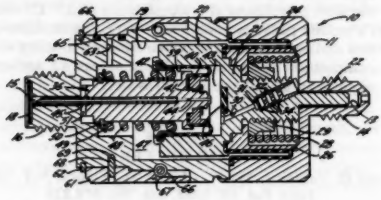
means for fixing said arms in angular position relative to said horizontal frame.

4,524,793

AUTOMATIC RESERVOIR BLEED VALVE

Bernard Silverwater, Plainview, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Oct. 14, 1983, Ser. No. 541,985
Int. Cl.³ F16K *24/00*
U.S. Cl. 137—198 **13 Claims**



1. An automatic bleed valve for pressurized fluid reservoirs comprising, in combination,

(a) a housing having a flow path extending therethrough,

(b) first and second flow restricting means interposed in said flow path, one of said flow restricting means including a capillary,

(c) pressure-sensitive sealing means responsive to the pressure drop across one of said flow restricting means, said pressure-sensitive sealing means comprising a piston through which a portion of said flow path runs, said piston including one of said flow restricting means,

(d) biasing means engaging said piston, and

(e) an abuttable sealing member positioned to engage one end of the flow path through said piston upon movement of said piston against the force of said biasing means when the pressure drop across said piston exerts a force on said piston exceeding the force of said biasing means such that the reservoir is bled automatically until the pressure drop exceeds a predetermined minimum, at which point said pressure-sensitive sealing means blocks said flow path to prevent the flow of fluid therethrough.

4,524,794

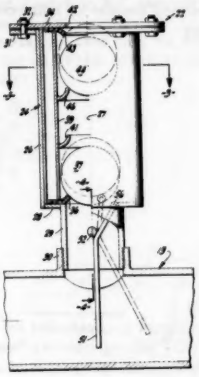
AIR RELEASE AND ANTI-SIPHON VALVE

Frederick K. Haines, 1600 McKinley Ave., Woodland, Calif. 95695

Filed Dec. 19, 1983, Ser. No. 562,557
Int. Cl.³ F16K *31/22*
U.S. Cl. 137—202 **1 Claim**

1. An air release and anti-siphon valve comprising a housing having an axis adapted to be disposed vertically, means at the bottom of said housing and including a first opening to the apex of a fluid line and to the interior of said housing, a first valve seat within said housing and surrounding said first opening, means at the top of said housing and including a second opening to the atmosphere and to the interior of said housing, a second valve seat within said housing and surrounding said second opening, a first ball valve within the lower part of said housing and movable between a position on said first valve seat and blocking said first opening and another position off of said first valve seat and unblocking said first opening, a second ball valve within the upper part of said housing and movable between a position on said second valve seat and blocking said second opening and another position off of said second valve seat and unblocking said second opening, means for mechanically lifting said first ball valve from said first valve seat, said

lifting means including a lever adapted to extend through said first opening into and at least part way across said fluid line and



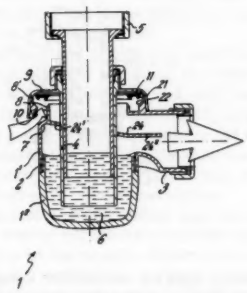
into said housing, and means for pivoting said lever on said housing for lifting movement by one end of said lever against said first ball valve.

4,524,795

HYDRAULIC DEVICE FOR THE DRAINAGE OF WASTE WATER

Kurt S. B. Ericson, Prins Boudewijnlaan, 48, B-2230 Schilde, Belgium, and Gijsbrecht H. J. Van Olst, Leusden, Netherlands, assignors to Kurt Sture Birger Ericson, Schilde, Belgium

Filed Nov. 10, 1982, Ser. No. 440,696
Claims priority, application Belgium, Nov. 12, 1981, 891,095
Int. Cl.³ E03C 1/295
U.S. Cl. 137—216.2 **2 Claims**



1. In an apparatus for draining waste liquid of the type including a container having an upper part and a lower part; an inlet pipe extending downwardly into said container; a water seal within said lower part, said inlet pipe extending into said water seal; a waste liquid outlet pipe opening from said container at a location above said water seal whereby the upper surface of said water seal is exposed to gas from said waste liquid outlet pipe; an automatic air valve at said upper part, said valve having an air entry duct into said container and a valve element for closing said air entry duct when the pressure acting at said waste liquid outlet pipe equals or exceeds the pressure acting at said air entry duct, the improvement comprising:

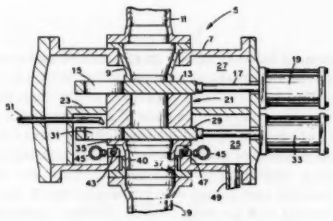
an internal partition fixed to the inner wall of said upper part of said container around said inlet pipe and below said air valve, said partition being extended by a substantially horizontal wall section across said upper part into the entry from said container into said waste liquid outlet pipe, whereby said partition separates said water seal from said air valve and protects said air valve against splashing or rising of said water seal.

4,524,796

SLIDING-GATE VALVE FOR USE WITH ABRASIVE MATERIALS

William J. Ayers, Jr., Morgantown; Charles R. Carter, Fairmont; Richard A. Griffith, Morgantown; Richard B. Loomis, Bruceton Mills, and John E. Notestein, Morgantown, all of W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 24, 1982, Ser. No. 422,795
Int. Cl.³ F16K 3/36, 25/00
U.S. Cl. 137—240 **2 Claims**



1. A valve assembly for controlling the flow of abrasive, particulate material comprising:

a valve body;

partition means in said body for dividing said body into first and second compartments;

a tubular inlet extending into said first compartment;

a stationary annular seat disposed in the partition means for placing the first and second compartments in registry with one another, said annular seat being spaced from said tubular inlet;

a displaceable tubular support member disposed in said second compartment and spaced from said annular inlet;

said tubular inlet, annular seat and tubular support member cooperatively defining a flow channel through said valve body;

a first gate in said first compartment comprising an apertured plate disposed in the space between confronting surfaces of said tubular inlet and said annular seat, said gate being mounted in said first compartment for transverse movement between first and second positions where the aperture in said apertured plate is respectively in and out of registry with said channel;

a second gate in said second compartment comprising a further apertured plate disposed in the space between confronting surfaces of said annular seat and said support member and supported by the latter for displacement therewith and mounted for movement transverse to said displacement between first and second positions where the aperture in said further apertured plate is respectively in and out of registry with said channel; and

drive means for displacing said annular support member and said further apertured plate into a first position to sealably engage said further apertured plate with said annular seat when the aperture in the further apertured plate is either in or out of registry with said channel and for displacing said annular support member into a second position during the displacement of said second apertured plate into either of said positions where the aperture in said further apertured plate is either in or out of registry with said channel.

4,524,797

SOLENOID VALVE

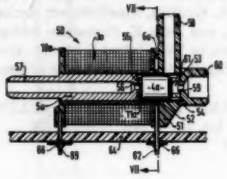
Corneliu Lungu, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 432,395

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206692

Int. Cl.³ F16K *11/07, 31/08*

U.S. Cl. 137—343 **2 Claims**



1. A solenoid valve including an exciter coil and an armature in the form of a permanently magnetic bar which is coaxially plungable into said coil and polarized in the direction of its axial movement, comprising a core of a first magnetic material projecting at one end thereof into said coil to form a limit stop for the rest position of said armature, a valve housing including one housing part forming a supporting form for said coil, another housing part forming a central passage in said core, a further housing part forming a valve chamber communicating with said central passage and guiding said armature, the end of said valve chamber opposite said central passage being formed with a valve seat opening into an axial valve connector and a wall of said chamber communicating with a transversely directed valve connector; said core of said magnetic material having the form of a tubular conduit projecting into said central passage and defining at its outer end another axial valve connector and at its inner end a valve seat cooperating with said plunger which acts as a valving member; said parts of said valve housing together forming said housing as a molded single piece of synthetic material formed with a recessed neck surrounding said valve chamber; a magnetically conductive annular member mounted in said recessed neck, said annular member having a pair of soldering lugs for fastening the valve to a supporting plate; and further comprising an additional pair of soldering lugs extending from said molded single piece housing embedded in an end of said coil supporting form which is remote from said annular magnetically conductive member, said additional extending soldering lugs being electrically connected to terminals of said exciter coil.

4,524,798

SAFETY VALVE FOR AUTOMATICALLY STOPPING THE FLOW OF A FLUID BROUGHT BY A CONDUIT TO A RESERVOIR

Patrice Simard, 53 de Vimy Ave., Outremont, Quebec, Canada H3S 2P9

Filed Jul. 16, 1984, Ser. No. 631,405

Claims priority, application Canada, Sep. 16, 1983, 436911

Int. Cl.³ F16K *31/18, 33/00*

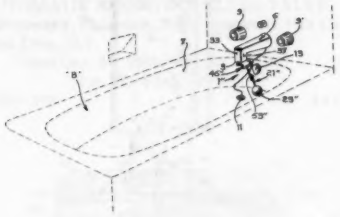
U.S. Cl. 137—448 **19 Claims**

1. A safety valve for automatically stopping the flow of a fluid coming from a supply conduit, into a reservoir when the level of the fluid in the reservoir has reached a predetermined maximum height, said safety valve being of the type comprising:

an obturation plate pivotally mounted in a housing of said supply conduit close to the outlet thereof, and

a control device including a float adapted to rock said plate from an open position where said plate allows free flow of said fluid to a closed position where said plate obturates said conduit outlet to thereby stop flow of said fluid into said reservoir when the fluid level therein has reached said predetermined maximum level, characterized in that

said obturation plate is pivotally mounted by a pivot arrangement located outside of said housing and of said supply conduit;



said pivot arrangement is constituted by two aligned stub axles respectively seating into two bearings made solid with two opposed external surfaces of said housing, and

said obturation plate is made solid with said stub axles by means of at least one arm entering said housing through said outlet of said supply conduit.

4,524,799

DELIVERY VALVES

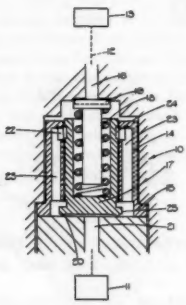
Ivor Fenne, North Greenford, England, assignor to Lucas Industries public limited company, Birminghan, England

Filed Jun. 8, 1983, Ser. No. 502,162

Claims priority, application United Kingdom, Jul. 15, 1982, 8220493

Int. Cl.³ F02M *39/00, 59/02*

U.S. Cl. 137—516.27 **5 Claims**



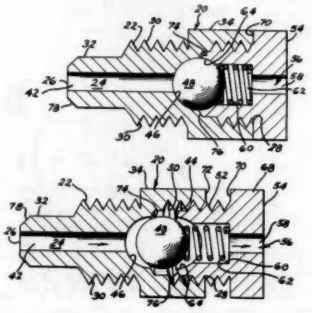
1. A delivery valve for use in a fuel injection system for a compression ignition engine comprising in combination, a delivery valve body defining a bore, a valve member slidable in the bore, resilient means biasing the valve member towards one end of said bore, a first groove defined in the wall of the bore adjacent said other end thereof, a second groove defined in the periphery of the valve member adjacent the end thereof remote from said one end of the bore, said grooves being in register with each other, a fuel flow path to said first groove which is opened when the valve member moves against said resilient means under the action of fuel under pressure, said second groove being uncovered beyond the other end of said bore after a predetermined movement of the valve member to allow fuel to flow by way of said grooves to an outlet, said predetermined movement determining the amount of fuel returned from said outlet when the valve member is moved by the action of said resilient means.

4,524,800

ONE-WAY BRAKE BLEEDER CHECK VALVE WITH SEALING CAP

Marion D. Holland, Louisville, Ky., assignor to Robert E. Robbins, Elizabethtown, Ky.

Filed May 14, 1984, Ser. No. 609,950
Int. Cl.³ F16K 15/18, 31/58
U.S. Cl. 137—516.27 4 Claims



3. For use with a hydraulic wheel brake cylinder of the brake system for wheeled vehicles, a one-way brake bleeder check valve having an elongated valve body with a longitudinal passage therethrough that has an inlet at the first end of the body and an outlet at the second end;

a. said passage having a first section extending inwardly from said first inlet end and being furnished with a recessed valve seat at its innermost end, said passage having a second section of larger diameter extending from the recessed valve seat to the said second outlet end;

b. and a valve element positioned in the second section of the passage adjacent the recessed valve seat, and internal threads formed in the said second section;

c. and an adjustable valve sealing cap having external threads for mating engagement with the threads in the second section of the passage, the innermost end of this adjustable valve sealing cap having a second recessed valve seat for sealing engagement with the valve element when the sealing cap is closed, said sealing cap including a longitudinal passage that is fitted with a compression spring normally bearing upon the said valve element for urging the valve element into a closed sealing engagement with the said first recessed valve seat, whereby when the valve sealing cap is closed the valve element is sealed with respect to both the first recessed valve seat and the second recessed valve seat;

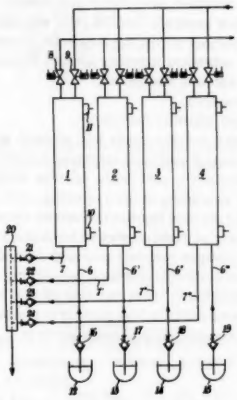
d. wherein the said first recessed valve seat has a tapered peripheral edge, and the said second recessed valve seat also has a mating tapered peripheral edge that is adapted to seal with respect to the said first tapered peripheral edge when the valve sealing cap is closed into sealing engagement with the valve element and the valve element is in sealing engagement with the first recessed valve seat.

4,524,801

APPARATUS FOR THE SELECTION, METERING AND DELIVERY OF LIQUIDS, IN PARTICULAR TREATMENT LIQUIDS FOR INDUSTRIAL LAUNDRY WASHERS

Enrico Magnasco, Rapallo, and Giorgio Viale, Chiavari, both of Italy, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,527
Claims priority, application Italy, Dec. 4, 1981, 49842 A/81
Int. Cl.³ F04F 3/00
U.S. Cl. 137—567 2 Claims



1. A device for selecting, metering and delivering treatment liquid to an industrial washer comprising a plurality of chambers, a plurality of tanks of treatment liquid, each tank being respectively connected to one of said chambers, means for sucking liquid from said tanks and for delivering said liquid to the respective chamber, said means including means for applying a vacuum on said tanks to suck the liquid and further including means for applying pressure on said sucked liquid to force it into said respective chamber, and control means for controlling the volume of each liquid delivered to its respective chamber, said control means comprising means for sensing the level of rise and descent of the liquid in said chambers, said means comprising a floating member on the liquid operatively associated with sensors of the instantaneous position of said floating member correlated with the level of the liquid, the control of the application of said vacuum and said pressure being performed under the control of the rise level of each liquid to be handled.

4,524,802

PINCH VALVE

John N. Lawrence, Whippany, and István Sándor, Kinnelon, both of N.J., assignors to Bio-Chem Valve Corp., East Hanover, N.J.

Filed Oct. 1, 1984, Ser. No. 655,765
Int. Cl.³ F16K 11/00
U.S. Cl. 137—595 6 Claims

1. An improved pinch valve for controlling the flow of fluids in an unrestricted manner in, at least, two flexible tubes, said valve comprising:

a. a solenoid housing including

1. an outer cylindrical wall, and an inner cylindrical core including a centrally disposed longitudinally extending opening having a first and second end, said core centrally disposed within said outer cylindrical wall,

b. a solenoid coil disposed about said core and between said

core and said outer cylindrical wall, said coil terminating in a pair of wires,

c. an armature member including centrally disposed openings on opposite faces of said armature member,

d. a tube retention member including a body portion and having

1. a centrally disposed first opening extending a portion of the longitudinal length of said body portion thereof,

2. a second opening disposed at right angles to said first opening, and passing through the sidewall of said body portion at at least one point,

3. third and fourth openings disposed at right angles to both said first and second openings in said tube retention member, said third and fourth openings sized to receive separate flexible tube members, said body portion further including means for fixedly connecting said tube retention member to said solenoid housing when said valve is assembled,

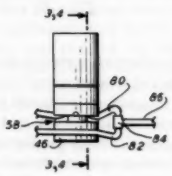
e. a pin member,

f. a plunger member including

1. a body portion sized and shaped to nest in said first opening of said tube retention member when said valve is assembled, said body portion including a longitudinally extending slotted opening, said body portion having an arcuate segment removed therefrom to create an opening at right angles to both the longitudinal axis of said plunger member and said slotted opening,

2. a first centrally disposed protruding portion extending longitudinally from one end of said body portion,

3. a second protrouding portion extending axially from the opposite end of said body portion,



said plunger member nesting in said first opening of said tube retention member, said plunger member slideably captured in said first opening by said pin member, said pin member passing through said longitudinally extending slotted opening said body portion when said plunger member is assembled into the second opening of said tube retention member,

said pin member retentively held in the second opening of said tube retention member,

the first protruding portion of said plunger member retentatively positioned in one opening in said armature member,

g. means disposed between said second end of the longitudinally extending opening in said inner cylindrical core and the second opening in said armature member, for urging said armature member away from the first end of said inner cylindrical core to a first position when said tube retention member is secured to said solenoid housing, and when said solenoid coil is unenergized,

said armature member attracted towards said first end of said inner cylindrical core to a second position, when said solenoid coil is energized,

the first and second of said flexible tubes disposed in said third and fourth openings in said tube retention member respectively, said second flexible tube compressed between said second protruding portion of said plunger member and the body portion of said tube retention member, when said armature member is in said first position, whereby said first flexible tube is unrestricted, said first flexible tube compressed between the body portion of said plunger member and said pin member when said solenoid coil is energized and said armature member is in said second position,

said plunger member coaxially aligned with said armature member and said core of said solenoid housing, such that said flexible tubes are alternatingly compressed at a point on the axis of said valve.

4,524,803

SPOOL VALVE

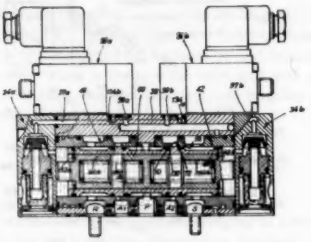
Kurt Stoll, Lenzhalde 72, 7300 Esslingen a.N., and Manfred Rüdle, Ermsweg 10, 7300 Esslingen-Berkheim, both of Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,015

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 8107889[U]

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—625.64 **25 Claims**



1. A spool valve having at least two positions, comprising: a valve housing having means defining therein a spool hole and plural control ports for fluid control which communicate with said spool hole; a valve spool axially movably supported in said spool hole and having fluid control collar means thereon for effecting fluid connections between selected ones of said ports in response to movement of said valve spool; servo piston means for moving said valve spool in two axial directions; and pilot valve means which can be remotely controlled for putting said servo piston means under pressure and freeing it of pressure; wherein said valve housing includes a body having a central opening therethrough and having openings therein which each serve as a portion of a respective one of said ports, two end plates shutting off said central opening at opposite ends of said body, and two liners which have therein said spool hole and openings which each serve as a portion of a respective one of said ports, said liners being positioned symmetrically in said central opening through said body with respect to a plane which is normal to the axis of said spool hole and being axially spaced from each other, and said servo piston means including spaces provided within said spool hole in said liners; including an air let-off valve provided in one of said end plates, said let-off valve having a large air flow cross-section; including a support plate for said valve housing, said support plate having plural connection openings which each communicate with a respective said port in said valve housing; and means which includes plural fixing parts for fixing said valve to said support plate, each said fixing part having a stem which extends through a through-hole provided in said valve body and which has a threaded portion which threadedly engages a threaded hole provided in said support plate, each said fixing part further having a head at an end thereof remote from said threaded hole, said head being disposed in a wider end portion of said through-hole and resting against a shoulder located between said wider end portion of said through-hole and a narrower portion thereof, said through-holes communicating with said central opening through said housing body, and said valve furthermore having for each said fixing part a sealing ring washer which encircles said stem adjacent said head for producing a seal between said head and said shoulder of said through-hole.

4,524,804
ELECTROPNEUMATIC SERVO VALVE FOR CONTROLLING A VOLUME CURRENT AND PRESSURE, RESPECTIVELY

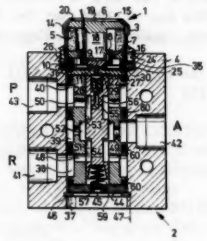
Wolf-Dieter Goedecke, Unterkirnach; Gerhard Schneckenburger, Hüfingen, and Reinhard Schwenzer, Aachen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,665

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216693

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—625.64 **5 Claims**



1. An electropneumatic servo valve for controlling a volume current or a pressure, respectively, comprising a preliminary control stage (1) for converting electrical signals into pneumatic control air pressure, a valve main stage (2) including a control pistion (54), spring means (57) for applying a restoring force to said control piston (54), means defining a control air space (29) between said preliminary control stage (1) and said valve main stage (2) and a nozzle impact plate system (22, 9, 56), said valve main stage (2) being adjustable by means of said control air pressure of said preliminary control stage (1) in such a way that said control piston (54) of said valve main stage (2) ia driven against the action of the restoring force of said spring means by means of a control air pressure which can be converted in proportional pneumatic pressure in said control air space (29) between said preliminary control stage (1) and said valve main stage (2) by means of said electrical signals via said nozzle impact plate system (22, 9, 56) in such a manner that said control piston (54) is positioned for controlling a proportional air current in dependence upon said control air pressure.

4,524,805
NORMALLY CLOSED DUCKBILL VALVE AND METHOD OF MANUFACTURE

Allan C. Hoffman, 5876 Republic St., Riverside, Calif. 92504

Filed Jul. 8, 1983, Ser. No. 511,837

Int. Cl.³ F16K *15/14*

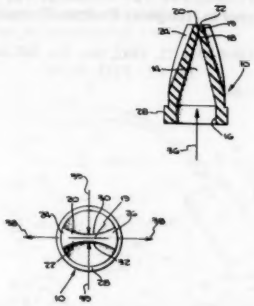
U.S. Cl. 137—846 **6 Claims**

1. A unitary duckbill valve comprising

a generally cylindrical body member provided with an axial fluid passageway and having an inlet end and an outlet end, said outlet end provided with an outlet slit, said body member progressively narrowing in cross-section from said inlet end to define a pair of opposed sealing lips at said outlet slit;

a pair of enlarged lip margins disposed adjacent to the opposite ends of said outlet slit; and

an increasing thickness of material progressively provided from the generally central portion of each of said lips outwardly toward the outer edges of each of said lip margins to form opposing arcuate surfaces which exhibit a



leaf-spring-like characteristic tending to maintain and urge said lips into a normally closed valve position.

4,524,806
PRESSURE VALVE FOR A COMPRESSOR

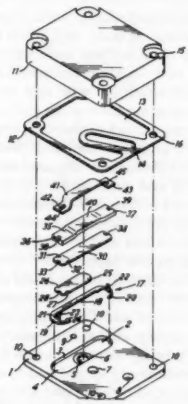
Bendt W. Romer, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Feb. 3, 1984, Ser. No. 576,733

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305791

Int. Cl.³ F16K *15/16*

U.S. Cl. 137—856 **9 Claims**

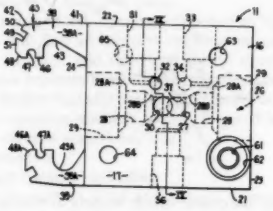


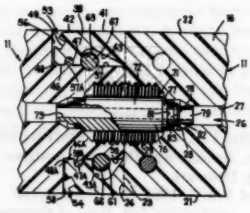
1. A pressure valve for a compressor, comprising, a valve plate, a valve cover, a valve seal disposed between said valve plate and said valve cover, means connecting said valve cover to said valve plate, said valve plate having an elongated recess in the surface thereof in which is disposed an aperture and a surrounding valve seat, an elongated resilient insert having upstanding pins, said insert being sprung into said elongated recess, an elongated resilient leaf spring having a recess at one end thereof in which one of said pins is disposed, and an elongated catch plate for limiting the stroke of said leaf spring.

4,524,807
SNAP-TOGETHER MODULAR MANIFOLD CONSTRUCTION

Vytautas J. Toliusis, Paw Paw Township, Van Buren County, Mich., assignor to Humphrey Products Company, Kalamazoo, Mich.

Filed May 21, 1982, Ser. No. 380,846
Int. Cl.³ F16L *39/00*
U.S. Cl. 137—884 **12 Claims**



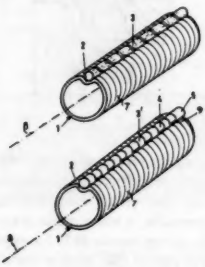


1. A fluid manifold comprising at least two modules, each said module having first, second and third surfaces thereon, said first and second surfaces being on opposite ends thereof, a fluid supply channel extending therethrough and terminating in first and second fluid supply ports respectively provided in said first and second surfaces, and a first fluid supply opening provided in said third surface and communicating with said supply channel at a location between said first and second supply ports, means integral with said modules for releasably interconnecting said modules in an end-to-end relationship in which said first and second surfaces on respective and adjacent said modules are adjacent and said first and second supply ports therein are substantially aligned, and seal means cooperable with adjacent said modules for preventing leakage of fluid from said fluid supply channels therein; wherein said interconnecting means includes first and second recesses provided in each said module in said second end surface thereof on opposite sides of said second supply port, first and second spaced and resiliently flexible arms on each said module which project outwardly beyond said first end surface thereof on substantially opposite sides of said first supply port and substantially parallel to said supply channel therein, said first and second arms respectively being received in said first and second recesses when said modules are in said end-to-end relationship, first detent means provided on each said arm adjacent an outer end thereof, and second detent means provided in each said recess and cooperable with said first detent means on a said arm of an adjacent said module when said modules are in said end-to-end relationship for releasably maintaining said modules in such relationship; and wherein said interconnecting means includes a transversely extending groove provided in an inwardly facing surface of each said arm at a location spaced from said outer end thereof, and first and second fastener openings in each said module extending transversely to and respectively communicating with said first and second recesses, each said fastener opening being aligned with a said groove in a respective said arm of another said module when said modules are in said end-to-end relationship, whereby fasteners inserted into said first and second fastener openings of a said module will cooperate with said grooves in said arms of an adjacent said module to maintain said modules in said interconnected end-to-end relationship.

4,524,808
VACUUM CLEANER HOSE

Wolfgang Fleischer, Elfershausen; Leo Eichelberger, Rüsselsheim, and Georg Endress, Frankfurt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich and Technochemie Kessler & Co. GmbH, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Jan. 31, 1984, Ser. No. 575,576
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303181
Int. Cl.³ F16L *11/12*; A47L *9/24*
U.S. Cl. 138—103 **4 Claims**



1. A vacuum cleaner component comprising:
a flexible main hose having an enclosing wall extending in part in a longitudinal direction, said wall having on an outer surface a groove extending in said longitudinal direction; and
a flexible supplementary hose for housing an electrical line extending in said longitudinal direction, said supplementary hose being attached to said main hose and disposed in part in said groove, said supplementary hose having a perforated wall for increased flexibility, said perforated wall substantially taking the form of a series of spaced cylindrical sections separated by cuts extending substantially transversely to said longitudinal direction.

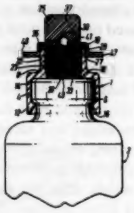
4,524,809
FITMENTS FOR CONTAINERS FROM WHICH LIQUID IS INTENDED TO BE WITHDRAWN BY A HOLLOW NEEDLE OR TUBE

Hugh R. Dent, Chippenham, England, assignor to Sterimatic Holdings Limited, Tortola, V.I.

Filed May 17, 1983, Ser. No. 496,488
Claims priority, application United Kingdom, Jan. 29, 1983, 8302481
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **16 Claims**

13. A method of withdrawing liquid from a container using a hollow needle or tube and a fitment comprising an enclosure incorporating sterilising means attached to the container, the method comprising separating an integral removable portion from an end wall of the enclosure by rupturing the material of the end wall so as to form an aperture in the end wall, passing the point of the needle or tube into the enclosure by way of the aperture so formed, moving the point of the needle or tube through the sterilising means and into the liquid in the con-

tainer, and withdrawing liquid from the container by drawing it up the needle or tube, whereby the point of the needle or



tube is sterilised by the sterilising means before being introduced into the liquid in the container.

4,524,810

METHOD AND APPARATUS FOR CONTROLLING THE DENSITY DISTRIBUTION OF BULK MATERIAL

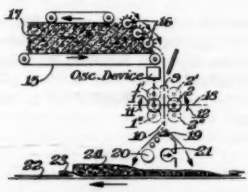
Dieter Arnold, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG., Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,047

Claims priority, application European Pat. Off., Dec. 10, 1982, 82111490.7

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—250 **4 Claims**



1. Apparatus for controlling the density distribution of bulk material in the manufacture of pressed wood panels comprising upstream means for storing and delivering a stream of bulk material, downstream means upon which the bulk material stream is deposited, a pair of spaced apart parallel rollers between the upstream and downstream means in the path of travel of the stream of bulk material and through which the stream passes, means rotating the rollers in opposite directions such that the inner surfaces of the rollers move in the same direction as the bulk material stream, means for adjusting the spacing between the rollers to a Predetermined width depending upon the desired width of the bulk material stream, and means connected to oscillate each roller in a direction transverse to the flow of bulk material through the rollers to render uniform the density along the width of the stream.

4,524,811

ENGINE OIL SAMPLING DEVICE

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108

Continuation-in-part of Ser. No. 438,240, Nov. 1, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 636,787

Int. Cl.³ B65D *51/16*

U.S. Cl. 141—325 **4 Claims**

1. In an engine containing a quantity of lubricating oil and having a centrally bored self-sealing access plug connected with a wall of the engine in communication with the oil, the improvement comprising:

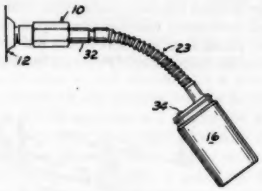
an oil sample receiving container;

a length of flexible tubing connected at one end with said container;

a hollow needle axially connected with the other end of said tubing,

said needle having an elongated tubular portion adapted at its end opposite said tubing for entering said access plug and filling said container with oil,

said tubular portion having a wall,



said tubular portion having an opening in its wall adjacent its said opposite end; and,

means including a grommet on the wall of said container for exhausting air during the filling of the container and for thereafter frictionally receiving and sealing with an intermediate portion of said tubular portion.

4,524,812

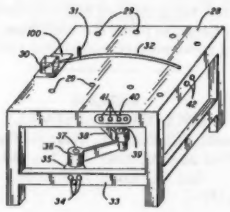
MODULATED FORMING MACHINE

Peter H. Murphy, 7031 Glendora, El Paso, Tex. 79912

Continuation-in-part of Ser. No. 407,094, Aug. 11, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,701

Int. Cl.³ B23B *5/18;* **B27C** *5/02*

U.S. Cl. 144—134 A **6 Claims**



1. A material forming machine comprising a forming tool, driven by a forming tool motor, a workpiece, a feed drive motor, sensing means which generate a electrical signal which is proportional to the rotational speed of the forming tool motor, a constant reference signal greater than zero and equal in magnitude, but opposite in sign to the signal produced by the sensing means at the minimum desired rotational speed of the forming tool motor, and a summing amplifier to combine the signal from the sensing means with the reference signal to vary the speed of the feed drive motor in response to variations in the speed of the forming tool motor.

4,524,813

TIRE BREAKER APPARATUS

Julie Gering, 3203 Silva Ave., Lakewood, Calif. 90712

Filed Oct. 7, 1983, Ser. No. 540,002

Int. Cl.³ B60C *25/06*

U.S. Cl. 157—1.17 **8 Claims**

1. A tire breaking apparatus for breaking the bead of a tire from the flange of a horizontally disposed wheel rim, said apparatus comprising:

a holddown bar that engages the upwardly facing side of said wheel rim;

attachment clamp means horizontally slideably carried by said holddown bar to secure said bar to said wheel rim;

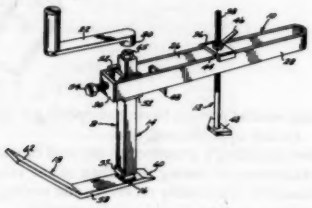
a locator plate on said holddown bar engageable with said flange to limit outward horizontal movement thereof away from said flange;

a tire press support column vertically slideably mounted on said holddown bar;

a pusher tube vertically slideably disposed within said support column;

threaded screw and nut means interposed between said support column and said pusher tube which effect relative vertical movement therebetween upon the application of relative rotation to said screw and nut means;

a collar horizontally slideably carried by said holddown bar,



said collar vertically slideably supporting said support column, while being restrained against vertical movement with respect to said holddown bar;

an adjustment screw carried by said holddown bar that engages said collar to vary the horizontal position of said support column relative to said holddown bar;

a stop lug formed on the lower portion of said support column for engagement with said collar to limit upward movement of said support column; and

a tire press mounted on the lower end of said pusher tube, said tire press being inserted between the tire bead and the wheel rim flange to break the bead from said flange upon downward movement of said pusher tube.

4,524,814

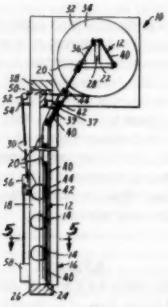
ENCLOSURE ASSEMBLY

Edward W. Deziel, 902 Felix St., West St. Paul, Minn. 55118

Filed Jun. 22, 1983, Ser. No. 506,728

Int. Cl.³ E06B *9/08, 9/262*

U.S. Cl. 160—133 **17 Claims**



1. An enclosure assembly comprising a plurality of stiff elongate generally rectangular panels having parallel longitudinal panel edges;

means mounting said panels generally in edge-to-edge relationship for edgewise movement along a predetermined path in directions normal to said panel edges;

a plurality of elongate, generally rectangular lengths of flexible material joining adjacent panels along said path, each of said lengths of flexible material being attached between two adjacent panels and at least some of said lengths having a width normal to the panel edges of adjacent panels affording relative movement of said adjacent panels between a closed position with the panel edges in contact, and a spaced position with the panel edges spaced apart and the strip of flexible material therebetween extending across the space between said adjacent panels, at least some of said lengths of flexible material joining adjacent panels being screen and each having opposite parallel longitudinal screen edges and screen edge portions adjacent said screen edges; means along said panel edges for attaching said screen edge portions to said adjacent panels with the screen edges adjacent the panel edges of the adjacent panels to form said lengths of screen generally into a cylinder projecting normally from said corresponding surfaces when said adjacent panels are in said closed position, and to tension said length of screen around and between said means for attaching along the panel edges of said adjacent panels when said adjacent panels are in said spaced position; and

means for relatively moving said panels along said path between said closed and spaced positions.

4,524,815

METHOD OF PRODUCING SEWING MACHINE NEEDLES

Klaus Pavel, Eynatten, Belgium, and Horst Lange, Aachen, Fed. Rep. of Germany, assignors to Rhein-Nadel Maschinennadel Gesellschaft mit beschränkter Haftung, Aachen, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,540

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111632; Dec. 21, 1981, 3150673; Jan. 18, 1982, 3201285; Feb. 27, 1982, 3207167

Int. Cl.³ B21G *1/04*

U.S. Cl. 163—5 **15 Claims**

1. A method of producing sewing machine needles from a cylindrical length of wire by the steps of

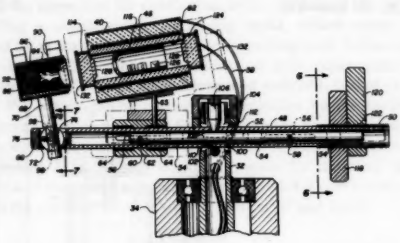
form pressing in which, starting from a length of wire having a starting cross section of a diameter substantially corresponding to the thickness of a needle butt, the length of wire is reduced substantially to a thinner final diameter and cross sectional form over at least the entire length of a needle shank including a needle point and the length of a shoulder between the needle butt and the needle shank and grooves are pressed in from curved outer surfaces of the length of wire in the region of the needle shank, wherein the reduction in cross section is effected by pressing the length of wire into laterally protruding flat burrs, leaving between the laterally protruding flat burrs outer surfaces of a transverse convex curvature defining substantially the final diameter of the needle shank and of said needle point and substantially having their said final cross sectional form, and

removing the flat burrs by a subsequent cutting.

4,524,816
CENTRIFUGAL CASTING FURNACE

Richard E. Plowman, York, and James A. VanLenten, Lancaster, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Feb. 21, 1984, Ser. No. 581,984
Int. Cl.³ B22D *13/06, 13/10*
U.S. Cl. 164—287 **11 Claims**

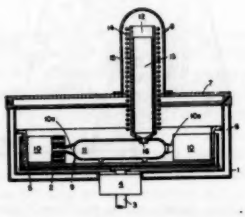


1. A centrifugal casting furnace comprising in combination,
a. a vertical rotatable shaft supported on a base,
b. a transverse arm supported by the upper end of said shaft,
c. an electrically heated muffle supported upon one end of said arm in elevated relationship to the axis thereof and having means to receive material to be cast.
d. power means connected in driving relationship to said shaft to rotate it at a predetermined speed, and
e. counterweight means vertically and longitudinally adjustably connected to the opposite end of said arm and comprising a pair of circular flat weights and said opposite end of said arm being threaded, one of said weights having a substantially central threaded opening and the other weight having a threaded opening substantially offset from the center thereof, said weights being threadably movable upon said arm to positions to counterbalance said weights and muffle statically relative to said shaft and effect a lock-nut arrangement with each other and the main mass of said offset weight being disposed uppermost relative to the axis of said arm to dynamically balance said arm to effect freedom from vibrations thereof when said arm is rotated.

4,524,817
CENTRIFUGAL CASTING UNIT FOR THE PRODUCTION OF PRECISION CASTINGS

Manfred Brugger, Birmenstorf; Peter Janczer, Zürich, and Hans Peter, Schlieren, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 6, 1982, Ser. No. 395,599
Claims priority, application Switzerland, Jul. 6, 1981, 4419/81
Int. Cl.³ B22D *13/00*
U.S. Cl. 164—290 **5 Claims**

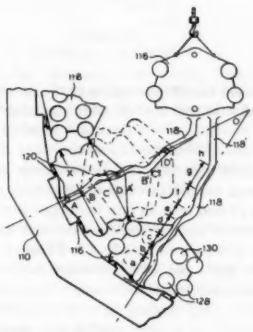


1. A centrifugal casting machine capable of manufacturing irregularly shaped precision cast parts, comprising: a machine frame; a vertically translatable housing having a double-wall configuration to provide a passageway for a cooling fluid; a housing cover with an induction melting device and a melt crucible for accommodating and melting a material to be cast, said melt crucible including transverse beams for supporting it on support plates which are connected to the housing cover to facilitate the installation, removal, and charging of the crucible, ends of said transverse beams being engagable with detent blocks of the housing cover so that the crucible can be removed to charge it with the casting material; a rotary table having a vertical axis of rotation, said table being enclosed within said housing; drive means for rotating said table; means for producing a vacuum in and introducing a protective gas into the space enclosed by the housing and the housing cover; a sliding carriage which supports and guides the housing for movement along said frame; an hydraulic cylinder mounted at one end to the machine frame; a cable pulley mounted on the piston rod of said hydraulic cylinder; a guide rail for guiding movement of said pulley; a cable which passes over the cable pulley, with one end of said cable being affixed to the machine frame and the other end being anchored to said sliding carriage; a pressurized oil reservoir for supplying hydraulic fluid to said cylinder; an electric limit switch for limiting the excursion of the housing; and a ceramic shell disposed on said table for accommodating a casting mold having individual, refractory workpiece molds, said shell being removable from said table to enable it to be preheated with the workpiece molds.

4,524,818
REPLACEMENT APPARATUS FOR GUIDE ROLL SEGMENT IN A CURVED GUIDE RACK OF A CONTINUOUS CASTING INSTALLATION

Joseph Pietryka, Versailles, France, assignor to Fives-Cail Babcock, Paris, France

Filed Jun. 20, 1983, Ser. No. 505,829
Claims priority, application France, Jun. 29, 1982, 82 11352
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—448 **1 Claim**



1. An apparatus for placing a segment of a cluster of bottom and top guide rolls in a curved guide rack of a continuous casting installation and for removing the segment therefrom, the segment comprising a support for the cluster of guide rolls, the support having two opposite sides extending generally radially with respect to the curved guide rack, and a bottom roller and a top roller being arranged at each one of the sides, the apparatus comprising
(a) two fixed guide rails extending generally radially with respect to the curved guide rack at the two opposite sides of the support, the bottom and top rollers engaging the guide rails for movement therealong, each guide rail including two portions inclined in opposite directions in relation to the generally radial direction of the guide rail and so disposed that, when the support is displaced along the guide rails, the support is pivoted into a skewed posi-

tion by displacement of the top rollers in one of the inclined guide rail portions and of the bottom rollers in the other inclined guide rail portion, which permits passage between the outer top guide rolls of two like segments adjacent thereto, and

(b) hoisting means for displacing the segment along the guide rails.

4,524,819

METHOD OF MANUFACTURING LEADED FREE-CUTTING STEEL BY CONTINUOUS CASTING PROCESS

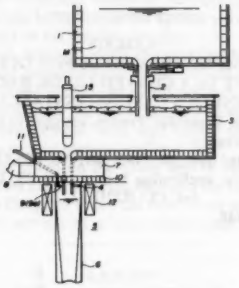
Tsuneo Yoshimura, Tokyo, Japan, assignor to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 354,004, Mar. 2, 1982, abandoned. This application Dec. 13, 1983, Ser. No. 561,134

Claims priority, application Japan, Apr. 7, 1981, 56-51268; Apr. 7, 1981, 56-51269; Apr. 7, 1981, 56-51270; May 14, 1981, 56-71410

Int. Cl.³ B22D *11/10, 27/02*

U.S. Cl. 164—468 **11 Claims**



1. A method of manufacturing steel containing an effective, uniformly distributed amount of lead, comprising:

pouring molten, refined steel into a ladle;

feeding said molten steel to a tundish;

continuously pouring said molten steel, at a selected rate, from said tundish through downwardly extending passage means of said tundish into the upper portion of an upright continuous casting mold associated with said tundish, which mold is substantially filled near the top thereof with molten steel, and which passage means extends beneath the upper surface of said molten steel in said mold, while simultaneously adding, at a selected rate, to the upper surface of said molten steel in said upper portion of said mold, above and laterally offset from said molten steel being poured into said mold through said passage means from said tundish, a lead feed material selected from the group consisting of lead, lead alloys, lead surface coated with a metallic material, and lead alloys coated with said metallic material, said metallic material being essentially free of lead and being composed of one or more suitable metals which do not adversely affect the properties of said steel, which lead feed material melts in contact with said molten steel to form a molten mixture in said upper portion of said mold, while simultaneously uniformly horizontally stirring said mixture in said upper portion of said mold by means of electromagnetic stirring force whereby said lead feed material is substantially uniformly mixed throughout said molten steel in said upper portion of said mold.

4,524,820

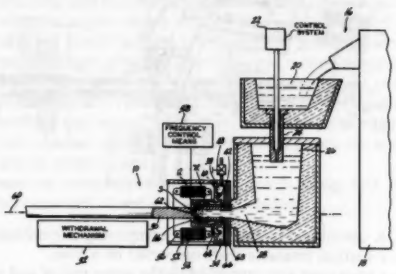
APPARATUS FOR PROVIDING IMPROVED SLURRY CAST STRUCTURES BY HOT WORKING

Damian V. Gullotti, Cheshire; Joseph Winter, New Haven, both of Conn.; Kenneth P. Young, Ballwin, and Robert D. Evans, Manchester, both of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,621

Int. Cl.³ B22D *11/12*

U.S. Cl. 164—476 **8 Claims**



1. A process for providing metal material having an improved structure for forming into a desired article, said process comprising:

slurry casting said metal material into a continuous member having an initial cross-sectional area and a structure comprising islands of solid particles enveloped by a solute-rich matrix; and

hot working said slurry cast material while in a solid state to reduce said cross-sectional area, said hot working causing said particles to deform,

heating said hot worked material for a desired period of time at a temperature sufficient to place said material into a semi-solid state,

whereby said material substantially rehabilitates to a typically slurry cast structure and exhibits finer particles and fewer eutectic melting rosettes than said slurry as-cast material in a heated and unworked condition.

4,524,821

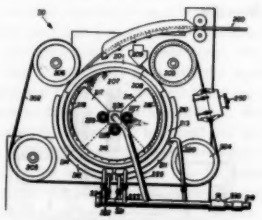
APPARATUS TO IMPROVE CASTING BAND LIFE

Milton E. Berry, Carrollton, Ga., and Mitsuyoshi Shibata, Ichihara, Japan, assignors to Southwire Company, Carrollton, Ga.

Filed Jan. 26, 1983, Ser. No. 461,098

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—482 **13 Claims**



1. In a continuous metal casting process of the type wherein molten metal is introduced into a continuously advancing mold cavity formed by at least one endless moving band surface in conjunction with other sealing surfaces, and wherein the molten metal is cooled to at least partial solidification, the im-

provement comprising extending band operating life by the additional steps of:

(a) enclosing a portion of the at least one endless moving band within an enclosure;

(b) passing the at least one endless moving band continuously through said enclosure; and

(c) heating the band within the enclosure to a temperature of at least 190° F.

7. In an apparatus for continuous metal casting of the type including a continuously advancing mold, which mold is formed by at least one endless moving casting band surface of a moving band member in conjunction with other sealing surfaces for a portion of a predetermined path of travel of said band, the improvement comprising enclosure means having band entry and exit apertures for receiving the band, in combination with heat source means for producing heat and conveyance means adjacent said enclosure means for directing the heat to said enclosure means, in which the heat is concentrated within the enclosure for heating a portion of said band.

4,524,822

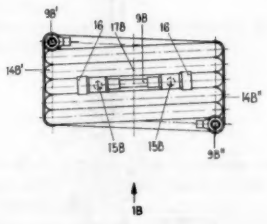
SAFETY HEAT-TRANSMITTING DEVICE

Manfred Hage, Ulm-Wiblingen, and Otto Junker, Gerlenhofen, both of Fed. Rep. of Germany, assignors to Wieland-Werke AG, Ulm, Fed. Rep. of Germany

Division of Ser. No. 221,164, Dec. 29, 1980, abandoned. This application May 3, 1983, Ser. No. 489,394

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—141 **7 Claims**



1. A heat transmitting device adapted to transmit heat between two different fluid mediums, comprising an elongate heat pipe and first and second pipelike jacket parts, said elongate heat pipe extending completely through said pipelike jacket parts substantially parallel thereto and said pipelike jacket parts being spaced from each other along the length of said heat pipe, wherein each of said pipelike jacket parts is sealingly connected at each end thereof to said heat pipe and includes means defining an inlet opening and an outlet opening, each of said pipelike jacket parts being adapted to have a respective said fluid medium flowing therethrough from said inlet opening to said outlet opening thereof, wherein said heat pipe is curved, and wherein said heat pipe is one of a spiral and a helix.

4,524,823

HEAT EXCHANGER HAVING A HELICAL DISTRIBUTOR LOCATED WITHIN THE CONNECTING TANK

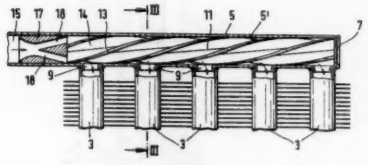
Karl-Ernst Hummel, Bietigheim-Bissingen; Bohumil Humpolik, Ludwigsburg; Hans-Joachim Ingelmann, Iggingen-Schoenhardt, and Karl-Heinz Staffa, Stuttgart, all of Fed. Rep. of Germany, assignors to Süddeutsch Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,120

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311579

Int. Cl.³ F28F *9/22*

U.S. Cl. 165—174 **20 Claims**



1. A heat exchanger, comprising:

at least one connecting tank comprising a chamber of substantially circular cross-section;

a plurality of essentially parallel tubes, each in communication with the connection tank;

a plurality of ribs arranged transversely to the parallel tubes; and

a distributor installation located within the connecting tank, comprising a plurality of helical distributor channels wherein each channel is in communication with at least one of said tubes and comprises one open and one closed end.

4,524,824

DENTAL CEMENT

Hirokata Shimokobe, Sapporo; Sueo Saito, Tokyo; Kentaro Tomioka, Chofu; Shoji Akahane, and Kazuo Hirota, both of Tokyo, all of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,517

Claims priority, application Japan, Apr. 20, 1982, 57-64630

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—35 **6 Claims**

1. A dental cement powder composition comprising a dental cement powder and 0.005–5 percent by weight of one or more of tannic acid derivatives selected from the group consisting of a tannic acid-protein combination, a tannic acid-formaldehyde combination, acetyl tannate and a metal salt of tannic acid, said tannic acid derivatives being sparingly soluble in water, said tannic acid derivative being present in amount sufficient to reduce the solubility of the dental cement formed with the dental cement powder, wherein the dental cement powder is the powder of a dental cement which is a zinc phosphate cement, a polycarboxylate cement prepared from the reaction of a basic component and a polycarboxylic acid or a glass ionomer cement.

4,524,825

WELL PACKER

William M. Fore, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 1, 1983, Ser. No. 557,090

Int. Cl.³ E21B *33/129*

U.S. Cl. 166—139 **11 Claims**

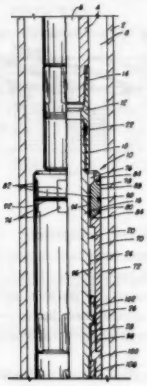
1. A pack-off device for a well bore, comprising:

mandrel means having first ratchet means and lug means associated therewith;

tubular housing means having second ratchet means, slot means and drag spring means associated therewith;

radially expandable slip means disposed about said mandrel means including upper slips and lower slips adapted to cooperate with slip wedge means and be moved radially outward thereby in response to relative longitudinal movement between said mandrel means and said housing means, said upper slip is secured to said housing means by an upper slip guide,

said slip wedge means comprises an annular body having upper and lower channels therein disposed about said



mandrel means, said channels possess radially inclined faces,

said slip wedge means is longitudinally slidably secured to said upper slip guide,

said lower slips have a lower slip guide associated therewith, and

said upper and lower slips possess radially inclinded inner faces adapted to cooperate with said channel faces;

a compressible packer element disposed about the lower end of said mandrel means below said lug means, said slot means, said drag spring means and said slip means; and

packer element compression means associated with said mandrel means and said housing means.

4,524,826

METHOD OF HEATING AN OIL SHALE FORMATION

Kerry D. Savage, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

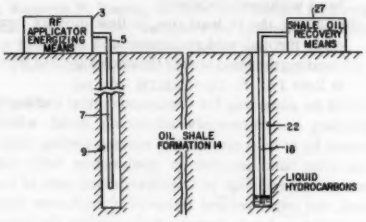
Filed Jun. 14, 1982, Ser. No. 387,996
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—248 **5 Claims**

1. A method of heating an oil shale formation to produce fluid hydrocarbons comprising

radiating RF electromagnetic energy into the oil shale formation for a predetermined first time interval from a first borehole which penetrates said oil shale formation,

producing fluid hydrocarbons, when available, during said first time interval from a second borehole penetrating said oil shale formation a predetermined distance from said first borehole,

radiating RF electromagnetic energy into said oil shale formation during a predetermined second time interval from said second borehole,



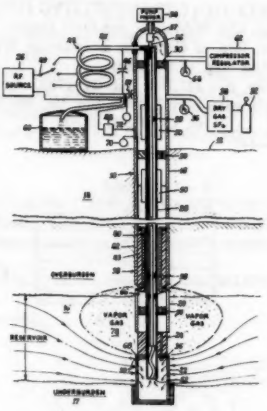
producing fluid hydrocarbons during said second time interval from said first borehole.

4,524,827

SINGLE WELL STIMULATION FOR THE RECOVERY OF LIQUID HYDROCARBONS FROM SUBSURFACE FORMATIONS

Jack E. Bridges, Park Ridge; Allen Taflove, Wilmette, and Guggilam C. Sresty, Chicago, all of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Apr. 29, 1983, Ser. No. 489,756
Int. Cl.³ E21B *36/00*
U.S. Cl. 166—248 **32 Claims**



1. A method for recovering liquid hydrocarbons from a water-containing subsurface formation through a borehole extending from the surface of the earth into said formation, said method comprising the steps of:

disposing an electrode in said borehole in at least a first portion of said formation,

producing liquid through said borehole from said first portion of said formation, and

applying electrical power through said electrode at a rate sufficient to vaporize water in an annular region of said formation extending from said borehole above said first portion while leaving water in said first portion substantially in the liquid phase.

4,524,828

METHOD OF USING THIXOTROPIC CEMENTS FOR COMBATING GAS MIGRATION PROBLEMS

Fred Sabins, and Jerry D. Childs, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 11, 1983, Ser. No. 540,742
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—293 **15 Claims**

1. A method for cementing a zone under pressure comprising pumping a thixotropic cement slurry into said zone, terminating pumping, and allowing said static slurry to set, wherein said slurry comprises water, hydraulic cement, a crosslinking agent selected from the group consisting of titanium chelates and a crosslinkable agent selected from the group consisting of water-soluble cellulose ethers; polyvinyl alcohol; homopolymers, copolymers and terpolymers of AMPS (2-acrylamido-2-methylpropane sulfonic acid), sodium vinylsulfonate, acrylamide N,N-dimethylacrylamide and acrylic acid; and mixtures thereof, whereby said slurry develops static gel strength in an amount sufficient to prevent fluid migration during some time after the pumping has terminated and until the cement slurry has set.

4,524,829

METHOD OF ALTERING THE PERMEABILITY OF A SUBTERRANEAN FORMATION

David J. Hanlon, and Stephen W. Almond, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 525,596, Aug. 23, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,419
Int. Cl.³ C09K *3/00*; E21B *43/22, 43/25*
U.S. Cl. 166—294 **20 Claims**

1. A method of altering the permeability of a subterranean formation comprising contacting said formation with an aqueous mixture comprising:

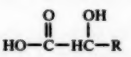
a. a water dispersible hydrophilic organic polymer having a molecular weight greater than 100,000 and containing carboxyl functionality; and

b. a crosslinking composition comprising

(1) water;

(2) a zirconium compound selected from the group consisting of zirconium oxychloride, zirconium acetate, zirconium ortho-sulfate, zirconium tetrachloride, zirconium carbonate, zirconium ammonium carbonate, and mixtures thereof;

(3) an alpha-hydroxy acid represented by the following formula:



wherein R is selected from the group consisting of hydrogen and an alkyl group having about 1 to about 3 carbon atoms; and,

(4) an amine compound represented by the formula:

wherein:

R_1 is hydroxyalkyl group having 1 to about 3 carbon atoms;

R_2 is selected from the group consisting of an alkyl group having 1 to about 3 carbon atoms and a hydroxyalkyl group having 1 to about 3 carbon atoms; and,

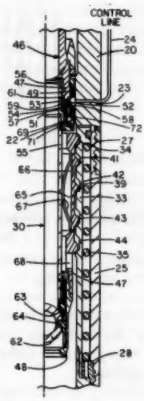
R_3 is selected from the group consisting of hydrogen, an alkyl group having 1 to about 3 carbon atoms and a hydroxyalkyl group having 1 to about 3 carbon atoms.

4,524,830

LANDING NIPPLE WITH SUBSURFACE SAFETY VALVE

Charles R. Williams, Carrollton, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Jul. 5, 1983, Ser. No. 511,012
Int. Cl.³ E21B *34/10, 43/12*
U.S. Cl. 166—321 **6 Claims**



1. Apparatus comprising:

a landing nipple including;

groove means in said nipple for receiving and latching a tool string in the nipple,

compression spring means supported in the nipple on upwardly facing shoulder means,

a spring guide within the spring means having downwardly facing shoulder means engaging said spring means,

said spring guide being tubular and having an upwardly facing shoulder for abutment with an actuator, and

a port in said nipple for introducing control fluid into the nipple bore; and

a separately removable tool string within said nipple including:

a releasable latch cooperable with said nipple groove means for latching the tool string to the nipple; and

a subsurface safety valve comprising;

a housing having exterior seal means straddling said nipple port with a seal above and a seal below said port when the string is landed,

a port in said housing communicating with said nipple port,

a piston in said housing exposed to said housing port,

an actuator cooperable with and movable downwardly by said piston,

a valve seat and cooperable valve member movable between open and closed positions by reciprocation of said actuator, and

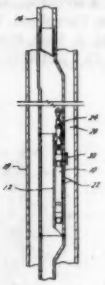
downwardly facing shoulder means on said actuator and engageable with said spring guide shoulder to compress said spring means in response to pressure against said piston to move said valve member to open position.

4,524,831

HYDRAULIC CONTROLLED WELL VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Dec. 27, 1983, Ser. No. 565,506
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—322 **10 Claims**



1. A hydraulic controlled valve for use in a well conduit for controlling fluid flow between the inside and outside of the conduit comprising,

a tubular body adapted to be connected in a well conduit, said body having an opening for providing communication between the inside and outside of the body,

a sliding tubular valve element having an opening and positioned inside of the body for longitudinally moving the valve opening between open and closed positions relative to said body opening,

a tubular conduit having an opening and positioned inside of said valve element, said tubular conduit having an inside in communication with the inside of the tubular body,

seal means between the conduit and said valve element about the conduit opening,

piston means sealably movable between the body and the tubular conduit and connected to the valve element for moving said valve element,

hydraulic control means connected to the body and in communication with one side of the piston, said control means adapted to extend to the well surface for controlling the movement of the piston, and

said piston having a second side in communication with the outside of the body through the body opening for hydrostatically compensating the piston.

4,524,832

DIVERTER/BOP SYSTEM AND METHOD FOR A BOTTOM SUPPORTED OFFSHORE DRILLING RIG

Joseph R. Roche, Humble; Gabriel G. Alexander, Houston, and William L. Carbaugh, Humble, all of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Nov. 30, 1983, Ser. No. 556,626
Int. Cl.³ E21B *17/01, 17/07, 33/038, 33/076*
U.S. Cl. 166—347 **16 Claims**

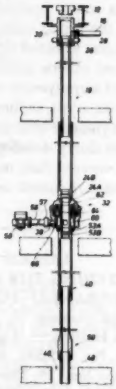
1. A system adapted for alternative use as a diverter or a blowout preventer for a bottom supported drilling rig and adapted for connection to a permanent housing attached to rig structural members beneath a drilling rig rotary table, the permanent housing having an outlet connectable to a rig fluid system flow line, the system comprising

a fluid flow controller having

a controller housing with a lower cylindrical opening and an upper cylindrical opening and a vertical flow path therebetween and an outlet passage provided in its wall,

a packing element disposed within the controller housing, and

annular piston means adapted for moving from a first position to a second position, whereby in the first position the piston means wall prevents interior fluid from communicating with the outlet passage in the controller housing wall and in the second position the piston means wall allows fluid communication of interior fluid with the outlet passage and urges the annular packing element to close about an object extending through a bore of the controller housing or to close the vertical flow path through the controller housing in the absence of any object in the vertical flow path,



means for connecting alternatively a vent line or a choke/kill line to said outlet passage provided in the controller housing wall,

a lower telescoping spool having a lower connector means at its lower end for connection to structural casing or to a mandrel connected to a conductor string cemented within the structural casing and an upper connection means at its upper end for connection to the lower cylindrical opening of the fluid flow controller, and

an upper telescoping spool having a lower connection means for connection to the upper cylindrical opening of the fluid flow controller.

4,524,833

APPARATUS AND METHODS FOR ORIENTING DEVICES IN SIDE POCKET MANDRELS

Robert L. Hilts, Farmers Branch, and Robert W. Crow, Irving, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 23, 1983, Ser. No. 535,214
Int. Cl.³ E21B *23/03*
U.S. Cl. 166—381 **24 Claims**

1. Apparatus for installing a well tool device in the offset receptacle of a side pocket mandrel in predetermined oriented relation therewith, said mandrel having means therein for orienting a kickover tool, said apparatus comprising:

a. a kickover tool having well tool device carrying means thereon, said kickover tool having orienting means thereon cooperable with said orienting means in said side pocket mandrel for orienting said kickover tool relative to said offset receptacle of said side pocket mandrel;

b. a well tool device carried on said well tool device carrying means of said kickover tool;

c. means for releasably attaching said well tool device to said well tool device carrying means; and

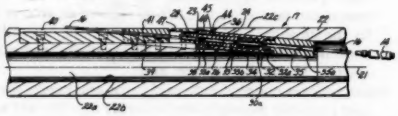
d. means separate from said attaching means for orienting said well tool device with respect to said well tool device carrying means.

4,524,834

CABLEHEAD SIDE ENTRY SUB

Charles D. Barron, and Felix Kuus, both of Gardena, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 22, 1982, Ser. No. 390,819
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—385 **35 Claims**



1. An apparatus for admitting a cablehead assembly attached on a cable into a drill string, the apparatus comprising:

a cylindrical tubular sub body for attachment in the drill string and having a substantially central passage therethrough;

an entrance port in a side of the sub body, the port running at an acute angle to a longitudinal axis of the drill string;

a cartridge assembly for sealing the cable in the port against pressure loss, the cartridge assembly being slidably moved to a seated position in the port, the cartridge assembly comprising a cylindrical cartridge and a packoff gland, each having a central passage for receiving the cable;

means for tightening the packoff gland into the cartridge to compress a packing element disposed in the cartridge about the cable to seal between the cable and the cartridge;

means for seating the cartridge assembly in a fixed longitudinal position in the port;

means for clamping the cable to the outside of the body for preventing movement of the cable; and

a cylindrical wear element removably attached at one end of the cartridge and extending from the cartridge toward the central passage of the tubular sub body.

13. A method for introducing a cablehead assembly into a passage along a drill string comprising the steps of:

disposing a cartridge assembly around a cable;

attaching a cablehead assembly to one end of the cable;

feeding the cablehead assembly from outside the drill string through a side entrance in a member of the drill string into the drill string, the side entrance being sufficiently wide to admit the cablehead assembly into the drill string along a path which forms an acute angle with a longitudinal axis of the member;

feeding sufficient cable longitudinally into the side entrance to lower the cablehead assembly to the desired location inside the drill string;

slidably seating the cartridge assembly within the side entrance;

clamping the cable to the outside of the member to prevent further longitudinal movement of the cable relative to the member;

tightening the cartridge assembly about the cable to seal the cable against pressure loss through the cartridge assembly;

securing a cover plate to the outside of the member adjacent the side entrance to prevent expulsion of the cartridge assembly from the side entrance; and

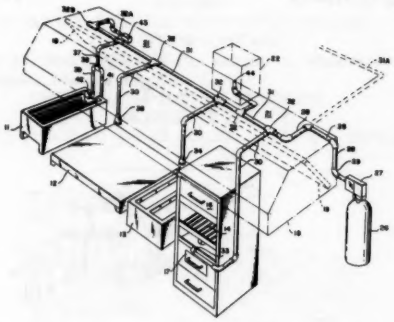
attaching a wear element on the cartridge assembly extending to the drill string passage to space the cable from the perimeter of the passage in the drill string.

4,524,835

FIRE SUPPRESSION SYSTEMS

Frank V. Mingrone, 67 Nels Rd., Milford, Conn. 06460

Continuation-in-part of Ser. No. 229,792, Jan. 30, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,439
Int. Cl.³ A62C *37/00*
U.S. Cl. 169—65 **9 Claims**



1. A fire suppression piping system for delivering dry chemical powder propelled by compressed non-oxidizing gas upon command to quench fires in flammable liquids, such as grease fires occurring in restaurant kitchen equipment, such as grills, ovens, deep fat fryers, charbroilers, exhaust plenum hoods and exhaust ducts, which present one or more individual, potential fire hazards, each requiring a different predetermined amount of dry chemical powder to extinguish a fire therein, and providing effective and economical distribution of the amount of powder required for each potential fire hazard without costly and inefficient redundant parallel runs of duplicate piping, comprising

storage cylinder means containing dry fire suppressing chemical powder and compressed nonoxidizing gas sealed therein by a valve head assembly,

individual nozzle means each positioned to deliver dry chemical powder to the exposed surface of the flammable liquid,

a continuous, non-bifurcated supply manifold having one end connected to the valve head assembly and its other end connected to the most remote of said nozzle means,

a plurality of distribution orifice Tees, each having a through passageway connected to form an uninterrupted part of said supply manifold, a lateral outlet, and means forming a diversion orifice extending partway into said passageway and having an orifice portal of predetermined size selected to

correspond to the predetermined quantity of dry chemical powder required for a specific individual fire hazard, and positioned to receive and divert said predetermined required quantity of powder from the storage cylinder and the supply manifold through the lateral outlet,

and a corresponding plurality of lateral conduits each connecting one of said lateral outlets to nozzle means, delivering gas-propelled fire suppressing powder diverted by the distribution orifice Tee for ejection of its respective predetermined quantity of said powder by its nozzle means toward one said flammable liquid surface,

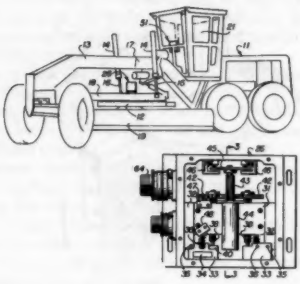
whereby when the valve head assembly is actuated the continuous supply manifold delivers the available fire suppressing powder from the storage cylinder directly to nozzles without forked-branching and without travelling through redundant parallel runs of duplicate piping.

4,524,836

SCRAPER WITH DUAL-DIRECTION BLADE TILT CONTROL

John V. Pehrson, Sparks, Nev., assignor to Reno Energy Systems, Inc., Sparks, Nev.

Filed Jun. 3, 1983, Ser. No. 500,891
Int. Cl.³ E02F *3/76, 3/85*
U.S. Cl. 172—4.5 **6 Claims**



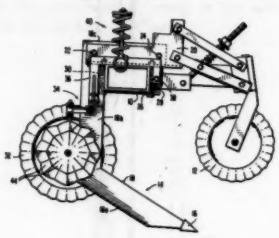
1. In combination, a scraper or the type having a frame, a turntable articulately supported by said frame, a scraper blade depending from said turntable, at least one ram interconnecting said frame and said turntable to adjust the tilt of said blade relative to said frame, and a blade tilt control, said control comprising an enclosure, means for mounting said enclosure on said turntable, a first vial rail, first mounting means pivotally mounting said first vial rail in said enclosure about an axis parallel to said turntable, a second vial rail, second mounting means pivotally mounting said second vial rail in said enclosure about an axis parallel to said turntable, first adjustment means for adjusting the tilt of said first vial rail relative to said enclosure, second adjustment means for adjusting the tilt of said second vial rail relative to said enclosure, first and second vials fixed in said first and second vial rails respectively, each said vial being of a type emitting a first signal when tilted off horizontal in a first direction and a second signal when tilted off horizontal in a second direction, an electric circuit connected to said vials having a switch to selectively include one or the other of said vials into said circuit, and electrical means to control energization of said ram in either direction responsive to signals emitted from the particular vial connected into said circuit by said switch.

4,524,837

SOIL CONDITIONING AND BED PREPARATION APPARATUS

Jerrell W. Harden, Banks, Ala., assignor to Allied Products Corporation, Chicago, Ill.

Filed Apr. 7, 1982, Ser. No. 366,281
Int. Cl.³ A01B *13/08, 49/02*
U.S. Cl. 172—156 **17 Claims**



1. Soil conditioning apparatus, comprising:

a main frame;

soil loosening means coupled to the main frame for cutting and loosening compacted soil, the soil loosening means including subsoiler means coupled to the main frame and extending downwardly to be pulled into the earth below the surface to form a slot or groove in the soil into which roots may grow;

soil preparation means coupled to the main frame for working the soil adjacent to and into the slot left by the forward motion of the subsoiler means therethrough, the soil preparation means including independently rotatable substantially solid surface disk-shaped members;

respective pivot arm means mounting said rotatable members to said frame on laterally opposite sides of and in at least partially overlapping relation with the subsoiler means and laterally spaced from the slot or groove formed by the subsoiler means for movement independently of the subsoiler means in respective substantially vertical planes relative to the soil surface; and

biasing means coupled with said pivot arm means for urging said rotatable members downwardly into the soil adjacent the subsoiler means independently of the depth of penetration of the subsoiler into the soil to push soil loosened by the subsoiler means back into the slot or groove formed by the subsoiler means to substantially fill the voids formed in the slot or groove and to substantially close the slot or groove behind the subsoiler means substantially to the depth of the slot or groove.

4,524,838

OIL WELL JAR

Wayne N. Sutliff, Bakersfield, Calif., assignor to Jim L. Downen, Bakersfield, Calif.

Filed Oct. 13, 1982, Ser. No. 437,196
Int. Cl.³ E21B *4/14*
U.S. Cl. 175—297 **17 Claims**

1. A for use in imparting jarring blows to an object lodged in the bore of a well, said jar comprising:

(a) a mandrel member and outer telescopically related member, said mandrel member and said tubular member movable between an extended and a collapsed of said jar;

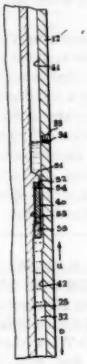
(b) means for connecting one of said members to a drill string and the other of said members to the object to be jarred;

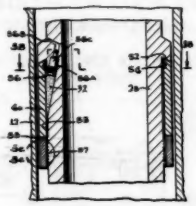
(c) telescopically overlapping portions of said members providing an annular chamber for confining an operating fluid;

(d) a sleeve and a cylinder extending into said chamber and into an essentially fluid tight fit with each other for a

selected portion of the telescopic travel between said extended and collapsed position;

(e) a fastener for capturing said sleeve in place with respect to a first one of said members, said fastener having threads and said first one of said members having threads for receiving said fastener, the threads of a said fastener and the threads of said first one of said members having a predetermined clearance between the opposing threads thereof;





(f) an operating fluid bypass in said first one of said members, said bypass being in fluid communication with the operating fluid above and below said sleeve, said bypass including an orifice having a fluid passageway therein; and

(g) filter means installed in fluid communication with an upstream of said orifice, said filter means being provided by the predetermined clearance between the threads of said fastener and the threads of said first one of said members, the maximum dimension of said predetermined clearance being less than a minimum size of the fluid passageway within said orifice.

4,524,839

APPARATUS FOR MONITORING TARE WEIGHT IN A FIBER BLENDING LINE

John M. Cochran, Jr., and Ronald N. Cleveland, both of Greenville, S.C., assignors to Frontier Electronics, Inc., Greenville, S.C.

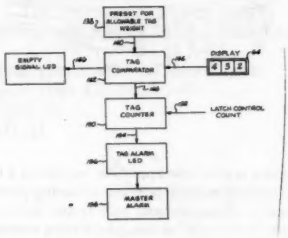
Filed Dec. 15, 1982, Ser. No. 450,106
Int. Cl.³ G01G *19/52, 23/14, 23/18*
U.S. Cl. 177—45 **2 Claims**

1. An apparatus for generating a signal responsive to a tag weight of fibers remaining in a weigh pan after said weigh pan has been opened for dropping fibers carried therein onto a receiver forming part of a fiber blending operation comprising:

means for generating a signal representing a predetermined maximum tag weight for fibers being dropped by said weigh pan;

means for generating a signal representing actual weight of fiber remaining in said weigh pan after a drop of said fibers;

means for comparing said predetermined maximum tag weight signal with said signal representing actual weight of fibers remaining in said weigh pan after a drop of said fibers and producing an output compared signal indicating the relationship between said signals;



an alarm; and

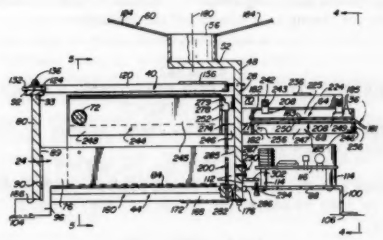
means for activating said alarm responsive to said actual weight of a tag of fibers which exceeds said predetermined maximum tag weight after said tag of fibers remains in said weigh pan for a predetermined number of successive drops of fibers by said weigh pan.

4,524,840

ELECTRONIC SCALE WITH NON-PARALLEL CAPACITANCE MEANS

James M. Stuart, Malvern, Pa., assignor to Malvern Scale Company, Malvern, Pa.

Filed Aug. 24, 1983, Ser. No. 526,178
Int. Cl.³ G01G *3/14*
U.S. Cl. 177—210 C **3 Claims**

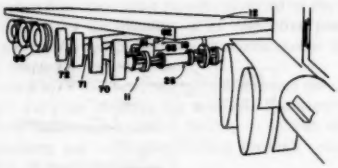


1. An electronic scale comprising frame means, platform means arranged to move upon receipt of some material thereon, spring means coupled both to said frame means and to said platform means, variable capacitance means including a first plate and a second plate, with one of said plates being movable so that movement of said platform means upon receipt of said material thereon causes a displacement of said movable plate reltive to the other of said plates to produce a signal indicative of the weight of said material, said displacement being achieved by said movable plate rotating about a fixed axis of rotation, with said plates being out of engagement with each other and being disposed non-parallel to each other over the entire operational range of movement of said movable plate and with the distance between all of the points on one of said plates and their respective corresponding points on the other of said plates being substantially proportional to the distance each respective point is from the axis of rotation over said entire operational range of movement of said movable plate.

4,524,841
AUXILIARY AXLE APPARATUS

Wayne Waggoner, P.O. Box 31357, Billings, Mont. 59107

Filed Nov. 21, 1983, Ser. No. 553,522
Int. Cl.³ B62D *61/10, 61/12*
U.S. Cl. 280—81 A 17 Claims

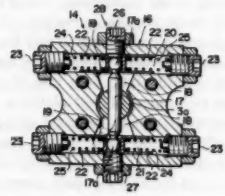


1. Auxiliary trailer axle apparatus including a frame portion, a carriage portion, a hitch portion, a bearing portion, a support portion and a lifting portion; said frame portion including a substantially horizontal section, supporting members extending downwardly from said horizontal section adjacent the ends thereof, said supporting members being pivotally connected to said horizontal section; said carriage portion including an axle housing section secured between said supporting members adjacent the lower ends thereof, an axle member carried by said axle housing section, wheels disposed on the ends of said axle member, expandable members disposed between said horizontal section and said axle housing section; said hitch portion including a tongue section extending from said frame portion substantially perpendicular to said axle section, connecting means disposed on a free end of said tongue section; said bearing portion including at least one pair of low friction pad members, one of said pad members being disposed adjacent each end of a top surface of said frame portion; said support portion including an upper support member disposed above said frame portion and closely adjacent thereto, said upper support member including a bottom surface in contact with said pad members of said bearing portion, means for affixing said support portion to a frame section of a trailer; said lifting portion including means connected to said axle housing section for raising said wheels off the ground.

4,524,842
FLEXIBLE COUPLING FOR PROVIDING VARIABLE RATE STEERING

Hirotaka Kanazawa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Mar. 10, 1983, Ser. No. 473,999
Claims priority, application Japan, Mar. 17, 1982, 57-43330; Mar. 19, 1982, 57-44858; Apr. 21, 1982, 57-67877; Apr. 21, 1982, 57-67878
Int. Cl.³ B62D *1/20*
U.S. Cl. 180—132 12 Claims



1. A power steering device for vehicles comprising:

a steering wheel;

a steering linkage which operatively connects the steering wheel to dirigible wheels of the vehicle so that the dirigible wheels can be turned as the steering wheel is operated to steer the vehicle;

a power assisting means inserted into the steering linkage to assist the steering force of the steering wheel, the steering linkage having a rotating portion which is rotated with the steering wheel to transmit the steering force of the steering wheel to the power assisting means and being divided into first and second parts;

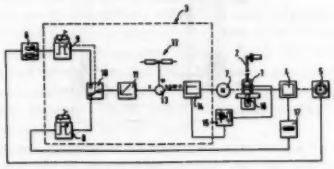
a first extensible resilient member and a second extensible resilient member which are opposingly disposed between said first and second parts of the rotating portion to connect said first and second parts of the rotating portion with each other and which are adapted to be elastically deformed to produce a rotational displacement between the first and second parts when the steering wheel is rotated; and

a restricting means for applying a set load to each of said first and second extensible resilient members and limiting the extension thereof, so that when one of the resilient members is compressed by a relative rotation between said first and second parts, the extension of the other is restricted so as to prevent the action of the set load thereof, whereby one of the resilient members is elastically deformed to produce the rotational displacement between said two parts only when the steering force from the steering wheel exceeds a predetermined value.

4,524,843
SPEED GOVERNOR FOR MOTOR VEHICLES

Eberhard Class, Geislingen; Heiner Schweizer, Bad Überkingen, and Günther Frank, Eislingen/Fils, all of Fed. Rep. of Germany, assignors to ULO-Werk Moritz Ullmann GmbH & Co. KG, Geislingen/Steige, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,178
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026423
Int. Cl.³ B60K *31/00*
U.S. Cl. 180—179 15 Claims



1. Apparatus for governing the speed of a motor vehicle having an engine equipped with a carburetor which includes a carburetor jet needle controlling the flow of fuel, said apparatus comprising a sliding member connected to said needle and responsive to action by a driver for actuating said needle, means for limiting displacement of said sliding member and electronic switch means selectively responsive to engine speed when vehicle speed is below a preselected value and to the vehicle speed when vehicle speed is above said preselected value for controlling said displacement limiting means to limit the response of the needle to driver actuation.

4,524,844
ANTI-DIVE FRONT WHEEL SUSPENSION SUITABLE FOR MOTORCYCLE

John E. Williams, Jr., Duquesne, Pa., assignor to AAKAC Industries Inc., Apollo, Pa.

Filed Feb. 10, 1983, Ser. No. 465,523
Int. Cl.³ B62K *25/08*
U.S. Cl. 180—219 18 Claims

1. A telescopic front-end suspension system suitable for motorcycles comprising in combination:

(a) a front tubular fork assembly having,

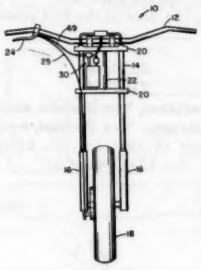
(i) a pair of upper tubes,

(ii) a pair of lower tubes slidably attached to said upper tubes to permit telescopic engagement of the tubes,

(iii) spring means carried by said tubes to provide a spring rate,

(iv) means for damping spring action including liquid carried in said tubes,

(b) a chamber provided in fluid connection with at least one of said tubes for permitting a fluid to escape thereinto when said suspension system is compressed, and



(c) control means for restricting the flow of said fluid to said chamber to increase the effective spring rate in at least one of said tubes upon application of brakes of said motorcycle, thereby restraining the collapse of said suspension system on braking.

4,524,845

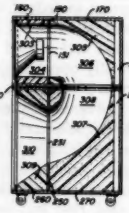
LOW FREQUENCY SPEAKER ENCLOSURE

Stephen M. Perrigo, 14321 SE. 187th Ave., Clackumas, Oreg. 97015

Filed Feb. 28, 1983, Ser. No. 470,792

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—152 **4 Claims**



1. An improved low frequency speaker enclosure comprising:

an upper cabinet structure divided by partitions into upper front and rear compartments wherein each of the upper compartments are provided with a contoured molded foam element; and the contoured molded foam element in the upper rear compartment foams a portion of a generally semi-circular, generally constant diameter, tube horn passageway; and the contoured molded foam element in the upper front compartment forms an opening, having one end that coincides with the generally constant diameter of said tube horn passageway, and whose other end is dimensioned to accommodate a low frequency speaker; and

a lower cabinet structure connected to the upper cabinet structure, wherein the lower cabinet structure is also divided by partitions into lower front and rear compartments, wherein each of the lower compartments are provided with a contoured molded foam element; and the contoured molded foam element in the lower rear compartment forms the remaining portion of the said generally semi-circular, generally constant diameter, tube horn passageway; and, the contoured molded foam element in the lower front compartment forms a sharply tapered conical opening, whose one end coincides with the said generally constant diameter of the tube horn passageway, and whose other end forms the mouth of the tube horn passageway.

4,524,846

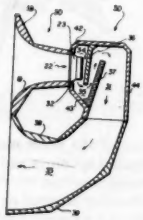
LOUDSPEAKER SYSTEM

Ronney J. Whitby, 8067 Center Pkwy., Sacramento, Calif. 95823

Filed Mar. 2, 1983, Ser. No. 471,495

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—152 **15 Claims**



1. A loudspeaker system comprising, in combination:

a mid-range acoustic transformer including a flared, stepped elliptical horn with a mid-range driver therein;

a woofer having a diaphragm;

a mid-bass acoustic horn mounted below said mid-range acoustic transformer, said mid-range bass acoustic horn having said woofer with said diaphragm disposed on a rear wall thereof to provide said diaphragm with a positive operational impedance encountered by front loading, said mid-bass acoustic horn having at least two opposing curved walls;

a low-bass acoustic horn positioned directly beneath said mid-bass acoustic horn and having a folded horn interior section which communicates with rear of said woofer to provide said diaphragm with a negative operational impedance encountered by rear loading, a balance being provided between said positive and negative operational impedances, a lower frequency response being provided to said low-bass acoustic horn by said diaphragm of said woofer; and

a pair of tweeters disposed on said opposing curved walls of said mid-bass acoustic horn, which curved walls disperse high frequency waves from said tweeters.

4,524,847

LADDER

Daniel Mintz, 70 Cambridge Pl., Brooklyn, N.Y. 11238

Filed Feb. 3, 1984, Ser. No. 576,742

Int. Cl.³ E06C *1/18, 1/32*

U.S. Cl. 182—23 **3 Claims**

1. A ladder for reaching a location above ground level comprising

a base section comprising a pair of transversely spaced, channel-shaped first rails, the first rails having longitudinally extending webs and longitudinally extending legs connected to the webs, and a plurality of longitudinally spaced first rungs secured to the first rails at the said longitudinally extending legs thereof,

each of the first rails being provided with an elongated opening in an upper portion of each respective web;

an extension section connected to and being pivotally and longitudinally movable with respect to the base section,

the extension section comprising a pair of transversely spaced channel-shaped second rails having longitudinal webs and legs and a plurality of longitudinally spaced second rungs secured to the second rails at the longitudinal legs thereof;

pivot means fixably secured to the longitudinal webs of the extension section to pivotally interconnect the base section with the extension section,

end portions of the pivot means being positioned within the elongated openings and being adapted for longitudinal movement within the openings, and

an L-shaped bracket secured to a second rail and adapted to move when the extension section is moved, the bracket engaging one of the first rungs when the extension section is longitudinally moved,

whereby the extension section may be pivoted relative to the base section between angular offset and longitudinally aligned positions.

4,524,848

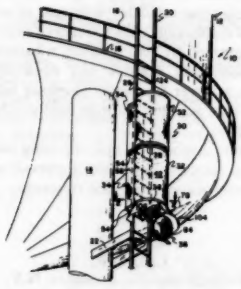
DEVICE FOR DETERRING UNAUTHORIZED CLIMBING OF PERMANENT LADDERS

John B. Russo, 1123 N. Mesquite, Corpus Christi, Tex. 78475

Filed Jul. 16, 1984, Ser. No. 631,384

Int. Cl.³ E06C *5/32*

U.S. Cl. 182—77 **15 Claims**



1. A device to deter climbing of permanent ladders of the type permanently secured to a support structure and having a pair of side rails and a plurality of rungs, comprising

a front section having a pair of generally coplanar longitudinal edges and a front panel spanning the longitudinal edges and extending out of the plane thereof to define a climbing path for a human between the front panel and the ladder;

means for securing the front section to the ladder for positioning the longitudinal edges parallel to the ladder side rails and juxtaposed thereto;

a back section, separable from the front section, having a back panel;

means for securing the back section to the ladder at the same elevation as the front section and for positioning the back panel away from the ladder rungs;

means preventing human movement between the back section and the ladder;

a door and means mounting the door for pivotal movement between a first closed position adjacent the front panel closing the climbing path and a second open position unblocking the climbing path; and

means for locking the door in the first position.

4,524,849

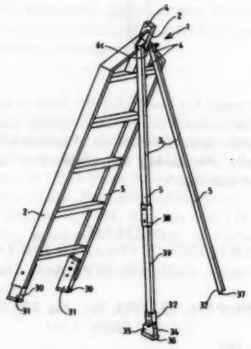
TRIPOD

Ronald G. Riddle, Auckland, New Zealand, assignor to Terrence Arthur Riddle, Takapuna, New Zealand, a part interest

Filed Jun. 11, 1984, Ser. No. 619,321

Int. Cl.³ E06C *1/20*

U.S. Cl. 182—170 **12 Claims**



1. A tripod connection including a link portion pivotally mounted with leg portions, a first leg portion mounted to one side of said link portion and second and third leg portions mounted to a substantially opposite side of said link portion, said legs and link portion pivotable into a condition where the said leg portions are mounted converging towards said link portion in a tripod like condition, said link member depending downwardly from the first leg pivot connection and generally upwardly of said second and third leg pivot connections, a portion of said link remote from said first leg pivot abutting an adjacent portion of said first leg portion to maintain said erected condition.

4,524,850

WEAR COMPENSATING OPERATING MECHANISM FOR DISK BRAKES

Erich Reinecke, Burgdorf, and Fritz Isernhagen, Wunstorf, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,429

Int. Cl.³ F16D *65/14, 65/54, 55/10, 65/24*

U.S. Cl. 188—71.8 **12 Claims**

1. A fluid pressure operated mechanism for disk brakes having brake shoes, comprising:

(a) a pair of expansion elements movable with respect to one another wherein the brake shoes are forced against the surfaces of a pair of brake disks,

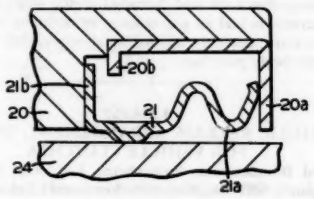
(b) compensating means located between said two expansion elements for maintaining a given clearance between said surfaces of said brake disks and said brake shoes,

(c) said compensating means takes the form of a one-piece, ring-shaped connecting link which is flexibly supported against one of said two expansion elements so as to oppose

the relative movement of said expansion elements during application of the brake shoes,

(d) said connecting link is frictionally connected to the other of said two expansion elements,

(e) a stop is provided on one of said two expansion elements which engages said connecting link to allow said connecting link to move relative to the other of said two expansion elements during brake application to compensate for brake shoe wear and to maintain a given clearance,



(f) said connecting link includes a plurality of first projections which function as return spring elements during brake release,

(g) said connecting link includes a plurality of second projections for frictionally engaging said other of the two expansion elements, and

(h) said first projections of said connecting link are designed as offset portions which are corrugated in the direction of the resulting spring force.

4,524,851

MECHANICAL SNUBBER

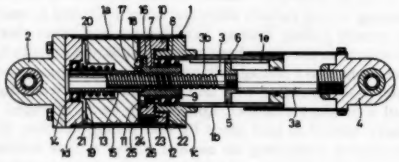
Susumu Sawano, Koganei; Yoshihiro Gofuku, Fujisawa; Junji Hashimoto, Kawasaki, and Takayuki Ando, Yokosuka, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Jun. 9, 1982, Ser. No. 386,520

Claims priority, application Japan, Jun. 11, 1981, 56-90057

Int. Cl.³ F16F *7/04, 7/10*

U.S. Cl. 188—134 **9 Claims**



1. A mechanical snubber, comprising in combination:

a cylindrical casing;

a rod member axially reciprocably fitted in said casing;

a rotary member fitted on said rod member and rotated by axial displacement of said rod member;

an inertia member rotatable in face-to-face relation with said rotary member;

a braking surface disposed in said cylindrical casing adjacent to said inertia member, said braking surface normally being disposed a small distance from said inertia member;

a first spring biasing said inertia member away from said braking surface and toward said rotary member;

a rotation control means provided between said rotary and inertia members and adapted to rotate said inertia member substantially in synchronism with said rotary member during slow rotary motion and to move said inertia member away from said rotary member and in to braking contact with said braking surface during quick rotary motion; and

an intermediate brake provided between said rotary and inertia members and opening against an end face of the other of said rotary and inertia members, a friction element, and a second spring disposed within said bore and arranged to press said friction element against said end face of the other of said rotary and inertia members, said second spring biasing said rotary member and said inertia member apart, but said first spring being stronger than said second spring, whereby said second spring does not cause said inertia member to move against said braking surface.

4,524,852

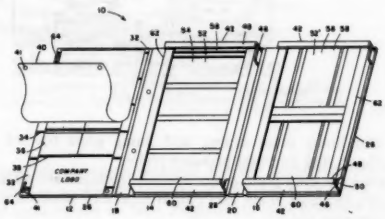
PLASTIC SIDING SAMPLE CASE

Grant F. Hess, Charlotte, N.C., assignor to National Gypsum Company, Dallas, Tex.

Filed Jun. 1, 1983, Ser. No. 500,096

Int. Cl.³ A45C *11/00*

U.S. Cl. 190—16 **10 Claims**



1. A sample case comprising three wide rigid flat main panels hingedly connected to two narrow rigid flat panels along the side edge of said narrow panels, said narrow panels each being between a pair of main panels, a sample building siding assembly insert on each of a middle and a first outer retainer means on, respectively, said middle and first outer main panels, said retainer means being adapted to removably retain said sample building siding assembly inserts on each respective middle and first outer panel, said retainer means each including elements disposed near the bottom and near the top of said middle and first outer panels which have a total width substantially equal to the width of said narrow panels, and which in a folded together condition, abut one another at the bottom and at the top and together form two end walls of said case, said two retainer means having a total thickness substantially equal to the width of said narrow panels, whereby said first outer panel can be folded over onto said middle panel and said two retainer means will abut and hold said middle and said first outer panels in spaced parallel relation, spaced apart a distance equal to the total thickness of said two retainer means, and a second outer panel can be folded onto the outer face of said first outer panel.

4,524,853

CLUTCH BRAKE ARRANGEMENT FOR FARM WORK MACHINERY OR OTHER EQUIPMENT

Shigeo Nagai, Nagano, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Feb. 4, 1982, Ser. No. 345,647

Claims priority, application Japan, Feb. 6, 1981, 56-16427; Feb. 9, 1981, 56-17805; Mar. 31, 1981, 56-48123

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 R **7 Claims**

1. A clutch brake apparatus, comprising:

a cam plate fixedly secured to an engine mounting;

an engine output shaft extending through said cam plate;

a rotatable member rotatably attached to said output shaft;

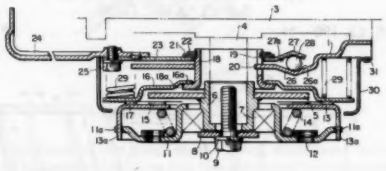
a non-rotatable pressure plate mounted on said cam plate, axially movable along said output shaft;

a clutch disk integrally rotatable with said output shaft, disposed between said pressure plate and said rotatable member;

a lining plate between said clutch disk and said rotatable member, rotatable with said rotatable member and axially movable along said output shaft, comprising a brake lining for engaging said pressure plate at a portion thereof and a clutch lining for engaging said clutch disk;

a brake spring extending in the direction parallel to said output shaft, between said pressure plate and said cam plate, for normally urging said pressure plate toward said rotary member and into engagement with said brake lining;

a clutch spring disposed between said rotatable member and



said lining plate urging said lining plate toward such clutch disk and said pressure plate;

a rotatable cam plate cover opposed to said cam plate, axially movable along said output shaft and attached to said pressure plate;

a cam ball between said cam plate and said cam plate cover;

means for moving said pressure plate with said cam plate cover;

an operation rod fixed to said cam plate cover for rotating the same to thereby move said cam plate cover away from said cam plate and move said pressure plate toward said cam plate against the force of the brake spring whereby said lining plate is engaged with said clutch disk by said clutch spring and is thereafter spaced from said pressure plate.

4,524,854

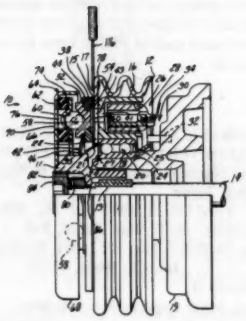
ADJUSTABLE AIR GAP AND METHOD FOR ELECTROMAGNETIC CLUTCH

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Sep. 28, 1982, Ser. No. 425,589

Int. Cl.³ F16D *27/10*

U.S. Cl. 192—84 C **8 Claims**



5. In an electromagnetic clutch, a connection enabling axial adjustment between a threaded clutch shaft and a threaded armature assembly carried by said threaded clutch shaft for rotation therewith to set an air gap spacing between an armature plate and an inner body pole face, comprising:

an adjusting nut threadably advanceable on said threaded clutch shaft and directly abutting with said threaded armature assembly to prevent an increase in said air gap spacing by retaining said threaded armature assembly against axial movement away from said inner body pole face; and

a plug member threadably advanceable relative said threaded armature assembly and having an abutment face engageable with said threaded clutch shaft to prevent a decrease in said air gap spacing by retaining said threaded armature assembly against axial movement toward said inner body pole face.

4,524,855

HYDRAULIC RELEASE ARRANGEMENT, ESPECIALLY FOR VEHICLE CLUTCHES

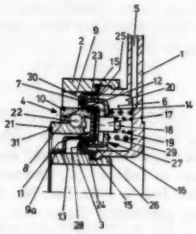
Manfred Brandenstein, Eussenheim, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,509

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133968

Int. Cl.³ F16D *25/08, 25/12*

U.S. Cl. 192—88 A **7 Claims**



1. In an hydraulic release device comprising an annular housing having radially inner and outer walls and an end wall, an annular rolling bearing having inner and outer rings and positioned in the space between said walls and radially spaced therefrom, and a rolling bellows sealed between said inner and outer walls to define with said inner and outer walls and end wall a pressure chamber, said bearing being arranged to be axially moved in said space by said rolling bellows; the improvement comprising an annular pressure plate within said pressure chamber coaxial with said rolling bellows and axially abutting said rolling bellows, first spring means biasing said pressure plate away from said end wall, said rolling bellows having folded-back regions at said inner and outer walls, an annular spacing element within said pressure chamber and having inner and outer annular projections engaging the folded-back regions of the rolling bellows adjacent the inner and outer walls of the housing respectively toward said pressure chamber, and second spring means biasing said annular spacing element away from said end wall.

4,524,856

CLUTCH RELEASE BEARING CONTROL MECHANISM

Pierre Renaud, Le Plessis-Trevise, France, assignor to VALEO, Paris, France

Filed Jun. 14, 1982, Ser. No. 388,162

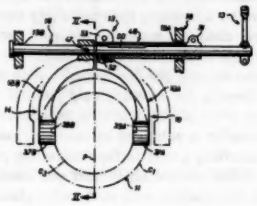
Claims priority, application France, Jun. 18, 1981, 81 12000

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **14 Claims**

1. In a clutch release bearing control mechanism comprising a shaft, a yoke having a pivot section pivotally mounted on said shaft and an operative section, and a control arm for rotating

said yoke on said shaft, said yoke further comprises two separate parts, at least one of said separate parts is adjustable in position parallel to the axis of said shaft, each of said separate parts having on it a respective bearing area adapted to act axially on a respective area on a clutch release bearing, said



areas on said clutch release bearing being at positions thereon which are substantially diametrically opposed, a sleeve being keyed to said shaft and adjustable in position axially thereon, one of said separate parts being mounted on said sleeve and the other on said shaft.

4,524,857

BOOK BLOCK FEED DEVICE

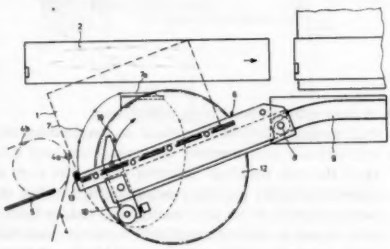
Horst Rathert, Minden, and Winfried Hedrich, Rahden, both of Fed. Rep. of Germany, assignors to Rahdener Maschinenfabrik August Kolbus, Rahden, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,748

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237256

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—409 **13 Claims**



1. Apparatus for transferring blocks comprised of plural articles, the articles being aligned within the blocks, from a lower to a higher level without disruption of the alignment, said apparatus comprising:

first conveyor means, said first conveyor means defining a motion path for the blocks which is generally inclined upwardly;

movable clamp means, said clamp means defining a second motion path for the blocks, said clamp means receiving and engaging the blocks;

feed table means, said table means having first and second edges and defining a plane therebetween;

means for imparting motion to said feed table means, said motion imparting means causing a first edge of said feed table means to follow a generally closed path, said closed path intercepting said upwardly inclined motion path whereby a block will be engaged by said table means first edge and will be raised from said inclined motion path, said closed path extending above and below said inclined motion path, the upper limit of motion of said feed table means first edge placing a block engaged by said feed table means in registration with said clamp means whereby said clamp means may engage the block and continue the motion thereof; and

means for guiding the motion of the second edge of said feed table means, said second edge being disposed oppositely with respect to said first edge and being located downstream of said first edge in the direction of motion of a block along said inclined motion path, said guide means causing said feed table means second edge to move from said inclined motion path to a path which follows the course of said second motion path.

4,524,858

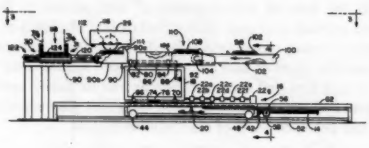
EDGER TRANSPORT AND POSITION APPARATUS

Carl W. Maxey, P.O. Box 3210, Hattiesburg, Miss. 39403

Filed May 24, 1983, Ser. No. 497,666

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—434 **6 Claims**



1. Sawmill apparatus adapted for the continuous-motion, adjustable, non-handoff, transfer of successive, elongate cants moved transversely of their longitudinal axes between intake and discharge stations, which stations are disposed respectively on the upstream and downstream sides of a wane-scanning station, where the wane-scanning station included means that generates, for each scanned cant, related wane-trim data, and the discharge station is positioned upstream from a wane-trim edger, said apparatus comprising

a first moveable carriage adapted for continuous, recurrent, reciprocal shifting between such an intake station and such a discharge station through such a wane-scanning station,

a second moveable carriage mounted for position adjustment on and relative to, and moveable with, said first carriage, including carrier means for supporting a cant transferred by the apparatus, and

position-adjustment means operatively interposed between said first and second carriages, adapted for operative connection to such a generating means in such a wane-scanning station to respond thereto regarding each scanned cant, thus to adjust the position of said second carriage relative to said first carriage, while the latter moves, in accordance with and as required by related wane-trim data, said means being constructed to accommodate both horizontal translational and rotational relative movement between the two carriages, with such rotational movement occurring about an upright axis which is fixed relative to said second carriage.

4,524,859

RAIL ASSEMBLY FOR UNDERGROUND COAL-GETTING MACHINES

Elmar Götte, Lüdinghausen, and Heinrich Schulte, Witten, both of Fed. Rep. of Germany, assignors to Klöckner-Becorit GmbH, Castrop-Rauxe, Fed. Rep. of Germany

Continuation of Ser. No. 373,053, Apr. 29, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,421

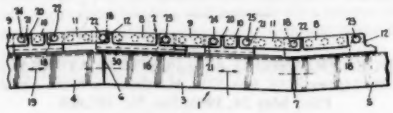
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123122

Int. Cl.³ B65G *19/18*

U.S. Cl. 198—735 **4 Claims**

1. A rail assembly for supporting the wheels of underground wheeled coal-getting machines, in combination with a coal conveyor comprising a plurality of conveyor pans intercon-

nected end-to-end in the direction of movement of the machines with the central axis of adjoining pans being angularly related, the assembly comprising a rail section mounted on each said pan and a connecting piece mounted for movement relative to each pan, each said section comprising at least three rail elements having adjoining ends interconnected for relative movement along said direction to provide play between adjoining rail sections, whereby the upper surfaces of said rail



sections lie parallel to said central axes of said pans and wherein the first of said elements of said section is fixedly mounted on each said pan, the second of said elements of each said section being movably mounted on each said connecting piece, and the third of said elements of each said section lying between said first and second elements and movably mounted to the pan and the connecting piece such that play is provided above and between each of said adjoining pans.

4,524,860

AUTOMATIC BOARD TRANSFER APPARATUS

Yoshihiko Misawa, Osaka; Makito Seno, Hirakata, and Koji Fujiwara, Yamatokouriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

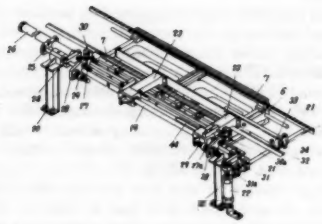
PCT No. PCT/JP82/00049, § 371 Date Oct. 22, 1982, § 102(e) Date Oct. 22, 1982, PCT Pub. No. WO82/02992, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 23, 1982, Ser. No. 440,218

Claims priority, application Japan, Feb. 23, 1981, 56-25144

Int. Cl.³ B65G *25/02*

U.S. Cl. 198—740 **3 Claims**



1. An apparatus for automatically transferring, positioning and delivering print boards onto which are to be mounted electronic elements and each of which has an end surface and a reference hole spaced from said end surface by a predetermined distance, said apparatus comprising:

transfer means for moving each print board to a predetermined position;

guides extending from said transfer means for guiding movement of the print board in a straight direction from said position;

an arm mounted for reciprocal movement in opposite directions parallel to said guides and for reciprocal pivotal movement in opposite directions generally transverse to the plane of the print board;

a pusher member integral with said arm for abutting the end surface of the print board at said position;

means for pivoting said arm toward the print board at said position such that said pusher member abuts the end surface of the print board;

means for moving said arm in said straight direction, such that said pusher member moves the print board along said guides in said direction from said position;

a pin mounted on said arm for movement relative thereto in a direction generally transverse to the plane of the print board, the center of said pin being spaced from the surface of said pusher member which abuts the end surface of the print board by a distance approximately equal to the predetermined distance between the end surface and the reference hole of the print board; and

means for moving said pin downwardly with respect to said arm and thereby for inserting said pin into the reference hole of the print board, whereby movement of the print board thereafter is achieved by said pin, said pin moving means comprising a cam surface extending parallel to said guides, a roller connected to said pin, means for urging said roller into contact with said cam surface and thereby for urging said pin downwardly with respect to said arm, and a portion of said cam surface having a contour to enable downward movement of said roller and thereby said pin with respect to said arm.

4,524,861

CONVEYOR DRIVING ROLLER

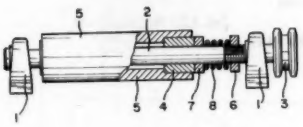
Yoshihiro Matsushita, Inuyama, Japan, assignor to Tsubakimoto Machinery & Engineering Co., Ltd. and Line Industry Corp., both of, Japan

Filed Sep. 10, 1982, Ser. No. 416,676

Claims priority, application Japan, Feb. 4, 1982, 57-14654[U]

Int. Cl.³ B65G *13/02*

U.S. Cl. 198—781 **3 Claims**



1. A conveyor driving roller comprising:

a shaft mounted for rotation about its longitudinal axis;

a cylindrical roller member mounted over said rotatable shaft through bushings mounted within the ends of said cylindrical roller member, said cylindrical roller member being adapted to be frictionally engaged and driven by said rotatable shaft through said bushings, said bushings being rotatable with respect to said shaft and being frictionally engaged and driven by said shaft;

a pressure plate slidably mounted on said rotatable shaft adjacent one end of said cylindrical roller member;

a compression spring mounted on said shaft and bearing against the face of said pressure plate opposite the face engaging said one end of said roller member; and

means for adjusting the degree of compression of said spring.

4,524,862

SCREW-JACK TYPE ACCUMULATION CONVEYOR

John M. Leach, P.O. Box 544, Walpole, N.H. 03608

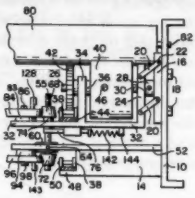
Filed Sep. 20, 1982, Ser. No. 420,025

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—781 **10 Claims**

10. An article accumulation conveyor comprising a frame, rollers mounted on the frame for supporting and moving the articles, roller rotating means mounted on the frame for movement into and and out of contact with the rollers, a screw-jack mounted in position to move the roller rotating means both into and out of contact with the rollers, means for actuating the screw-jack from the roller rotating means in both directions, a sensor mounted in position to be moved by being contacted by

articles moving on the article supporting rollers, and means connecting the sensor and the screw-jack actuating means to



control the actuation and direction of actuation of the screw-jack.

4,524,863

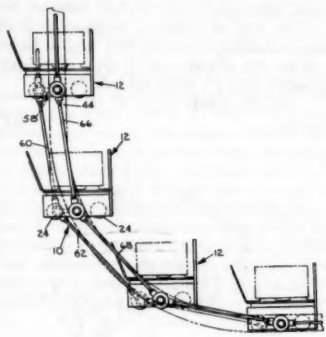
CONVEYOR APPARATUS

Robert A. Mogé , Milford, N.H., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 22, 1983, Ser. No. 516,015

Int. Cl.³ B65G *17/16*

U.S. Cl. 198—797 **1 Claim**



1. A conveying apparatus having a plurality of interconnected and spaced support trays moved by a linear drive unit in horizontal pathways of different elevations and in directions interconnecting one horizontal pathway with another, said conveying apparatus comprising:

(a) a plurality of first guide rollers rotatable mounted on the underside of each support tray;

(b) a plurality of second guide rollers rotatable mounted adjacent the sides of each support tray;

(c) a support track for receiving said first guide rollers for guiding the support trays in their horizontal pathways;

(d) a guide track operatively associated with said support track for receiving said second guide rollers to effect guiding each support tray from one horizontal pathway to another;

(e) a tie rod member pivotably interconnecting the second guide rollers of one support tray with the second guide rollers of the adjacent support trays defining an endless chain of the latter;

(f) a crank member pivotably connected at a first end to at least one of said second guide rollers and said tie rods operatively associated therewith; and

(g) a pair of crank rods pivotably connected to a second end of said crank member and extending in opposite directions for operative connection to the crank members associated with adjacent support trays, said crank rods have a cushion member mounted in one end for absorbing linear deviations resulting from dimension tolerance buildup of said tie and crank rods in said linkage means.

4,524,864

BELT CONVEYOR GAP STRINGER SUPPORT SYSTEM

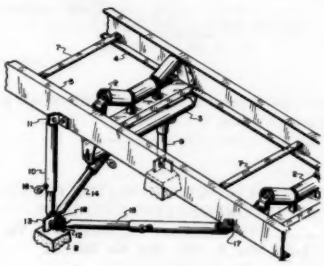
William D. Peterson, II, 1996 E. 4675 South, Salt Lake City, Utah 84117

Continuation of Ser. No. 367,563, Apr. 12, 1982,. This application May 21, 1984, Ser. No. 612,998

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.³ B65G *39/10*

U.S. Cl. 198—828 **10 Claims**



1. In a gap stringer conveyor belt carrying structure of the type which includes a pair of parallel spaced apart rigid stringers with belt carrying rollers therebetween, the improved underlying support for said structure which comprises in combination at least two spaced-apart load-bearing frames under said stringers each of said frames including a pair of extensible load bearing members each connected at one end to said structure to receive a part of the weight thereof and at its other end to a weight bearing anchor, a third extensible member connected at one end to said strucuture thence extending in a direction that is diagonally transverse to and in substantially the same plane as said pair of extensible load bearing members to terminate in a connection to an anchor, all of said extensible members being provided with means for fixing them at a selected length, at least said extensible weight bearing members being connected to said belt support structure and said weight bearng anchors by pivotal connections enabling their adjustment by pivoting at least about an axis parallel to said stringers, and at least one additional extensible rigid member extending diagonally between a connection adjacent the lower end of one of said extensible load bearing members and a point of connection on one of said stringers.

4,524,865

UNIVERSAL PLATFORM CHAIN

Edward L. von Hofen, 5449 Willow, Vermilion, Ohio 44089

Filed Nov. 6, 1981, Ser. No. 318,934

Int. Cl.³ B65G *17/06*

U.S. Cl. 198—852 **2 Claims**

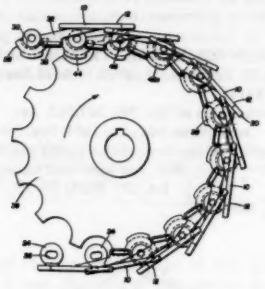
1. A conveyor system comprising a universal chain formed from a plurality of identical links each link being one completely integrated member and having:

(a) a crescent shaped platform load bearing surface,

(b) a ball member on a side opposite said platform load bearing surface at the front edge thereof, and

(c) a hemi-spherical cap member having an inside diameter equal to the diameter of said ball member and adapted to receive said ball member, wherein said ball member of one link member is connected to the cap member of a third

successive link member, said connection being a pivot point, and wherein the distance from a pivot point to a



successive pivot point is twice the width of said platform load bearing surface.

4,524,866

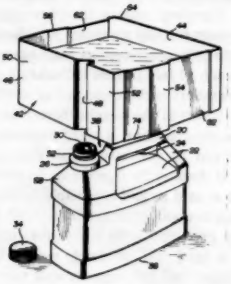
MOTOR OIL CATCH PAN AND MOTOR OIL CHANGE KIT INCORPORATING THE SAME

Paul J. Pollacco, 3819 Burlingame Pl., Alexandria, Va. 22309

Filed Mar. 9, 1984, Ser. No. 588,052

Int. Cl.³ B65D *85/00*

U.S. Cl. 206—223 **15 Claims**



1. A do-it-yourselfer's oil catch pan, for use with an openably and reclosably capped jug of new oil sufficient to fill or at least substantially fill the engine oil reservoir of a pre-selected motor vehicle to its proper level,

said oil catch pan comprising:

a self-supporting container sized and configured to fit under a motor vehicle crankcase and having a bottom wall and a peripheral sidewall with a top opening for receiving used oil drained from the crankcase;

said bottom wall of said container having means providing a seating surface means cooperable with said jug for enabling the oil catch pan to be seated on the jug in overlying relation thereto when the jug is upright, uncapped and emptied of new oil;

said bottom wall of said container having means defining an oil drain aperture formed therethrough;

closure member for said oil drain aperture, said closure member being removably positionable in obstructing relation to said oil drain aperture to block flow of used oil through said oil drain aperture;

said oil drain aperture being constructed and arranged to register with an opening in the jug when the oil catch pan is seated on the jug in overlying relation thereto with the jug in an upright, uncapped, emptied of new oil disposition, for enabling used oil which has been drained into the oil catch pan from the pre-selected motor vehicle through said top opening to be transferred from the oil catch pan to the jug upon manipulation of said closure member to unblock said oil drain aperture, thereby making it unnecessary to pour the used oil out of the oil catch pan through said top opening by tilting or tipping the oil catch pan, so that the used oil may be drained from the oil catch pan into the jug and the jug re-capped for transporting the used oil to a disposal site without spillage;

said closure member comprising:

a seal,

means adhering the seal perimetrically to said container bottom wall circumferentially of said oil drain aperture to be irreversibly pulled away or broken for opening said oil drain aperture, and

means associable with said seal and actuable without necessitating the user's dipping into the used oil for operatively destroying said seal in relation to said oil drain aperture, so that the used oil may be drained from the oil catch pan into the jug.

4,524,867

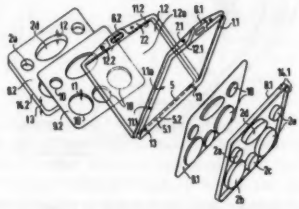
CASE FOR ACCOMMODATING WRITTEN MATERIAL FOR PRESENTATION PURPOSES

Hans-Jörg Klein, Möhrendorf, and Herbert Böhmer, Buckenhof, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 280,091, Jul. 2, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,517

Int. Cl.³ B65D *25/14, 57/00*

U.S. Cl. 206—232 **4 Claims**

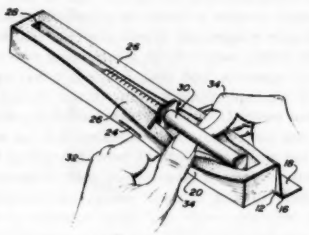


1. Case for accommodating written material for presentation, comprising two molded similar case halves formed of thin clear plastic material, said case halves each having a case wall with an inner space formed therein, a folding hinge connecting said case halves to each other for folding said halves open and closed, at least one removable and reusable transparent plastic wall inserted in each respective case half, said inserted walls each having receptacles with substantially planar surfaces molded therein for the written material, at least one opaque plastic wall fixed in place in each respective case half, said fixed walls having shapes with substantially planar surfaces molded therein each being receivable in a respective one of said molded receptacles in assembled condition of the case, the shapes and said molded receptacles having predetermined depths and other dimensions, the shapes having less depth than said molded receptacles defining a space between said surfaces for receiving the written material, and said other dimensions of the shapes and said other dimensions of said molded receptacles being substantially equal, a recessed grip formed in each respective case half, said grips being mutually aligned in closed condition of the case, and reinforcement ribs connected to said grips, said inserted walls being surrounded by a rim having a depth substantially corresponding to the depth of said receptacles forming guiding and spacing means for fitting said inserted walls into said inner spaces.

4,524,868
CARRYING CASE FOR PRE-DRAWN SYRINGE

Damon S. Buckley, and Marlene E. Buckley, both of R.D. 3, Box 3025, Stroudsburg, Pa. 18360

Filed Feb. 26, 1981, Ser. No. 238,375
Int. Cl.[3] B65D *85/10*
U.S. Cl. 206—364 2 Claims

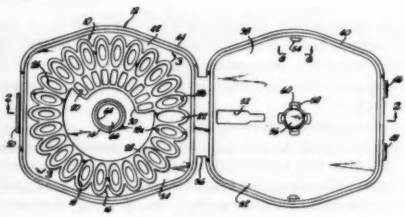


1. A carrying case for a pre-drawn syringe comprising:
(a) a generally parallelpipedal casing, said casing being made of deformable, pliant, resilient material of construction;
(b) an integral cover hingedly attached to said casing, said cover including a mid sction fold to provide an overlap portion for one face of said casing, said cover also including means to releasably secure said cover to said casing; and,
(c) a liner fitted within said casing, said liner contoured to fill said casing, at least one shaped aperture generally conforming in cross section to that of a drawn syringe to permit a syringe to be sunken therein, said aperture's distance from said casing being generally only wide enough to allow a user's thumb to span the distance, said liner consisting of a cellular, elastic material of construction so that a syringe resting in said aperture, snugly held, may be removed therefrom by a gentle simultaneously manual flexing of said casing and a deformation of said liner to separate said syringe from said liner to thereby expose and make prominent a portion of the syringe to facilitate its grasping and removal thereof by the user.

4,524,869
PILL DISPENSER AND METHOD OF LOADING

N. Joseph Nader, 1601 Highland Oaks Dr., Arcadia, Calif. 91006

Filed Jan. 17, 1984, Ser. No. 572,157
Int. Cl.[3] B65D *3/28, 83/04, 85/56*
U.S. Cl. 206—358 10 Claims

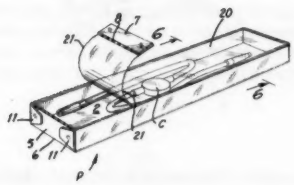


1. A pill dispenser for a prescribed dosage schedule comprising
a circular cartridge having a hub, first cavities about said hub at first radially equal locations therefrom, second cavities about said hub at second radially equal locations therefrom, said first and second cavities being open to one side of said cartridge, each said second cavity being aligned with and immediately adjacent said first cavity, the numbers of each said first and second cavities being preselected for the prescribed dosage schedule, and a distinguishable position at a said first radial location;
a housing having a base and a mounting means for rotatably mounting said hub on said base with said first and second cavities of said circular cartridge opening toward said base, said base including a hole therethrough positioned adjacent said first radial location and said second radial location for selective communication with said first and second cavities.

4,524,870
VISIBLE AND EASY ACCESSIBLE PACKAGE

Harry I. Roccaforte, Western Springs, and Robert A. Christie, Mundelein, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,521
Int. Cl.[3] B65D *65/28*
U.S. Cl. 206—608 1 Claim



1. A generally rectangular tray formed from a single blank of paperboard material, said tray being adapted to securely enclose an article stored therein yet enable easy and efficient access thereto, said tray comprising:
a rectangular bottom wall having pairs of opposed sides and ends;
a pair of rectangular upstanding side walls foldably connected respectively to the opposite sides of said bottom wall each said side wall comprising a rectangular side wall panel articulated to said bottom wall and a side flap articulated to the respective side wall panel along a fold line extending generally parallel to the bottom wall, said side flaps being foldably disposed in face-to-face contact with an outer surface of the respective side walls and adhesively secured thereto;
a pair of rectangular upstanding end walls foldably connected to the opposed ends of said bottom wall, each said end wall comprising a rectangular end wall panel articulated to said bottom wall and connected to the side walls, each said end wall further comprising an end flap articulated to said end wall panel along a cut fold line extending parallel to the bottom wall, each of said end flaps being folded into face-to-face contact with an outer surface of the respective end wall panel and adhesively secured thereto with a light bond adhesive which permits the respective end flap to be peeled away from the corresponding end wall panel; and
a transparent plastic cover sheet extending between the articulations of said side and end flaps to the respective side and end wall panels, said cover sheet further including edge portions overlying outer surfaces of each of said side and end flaps and adhesively secured thereto, said cover sheet including a pair of rupturable cut score lines substantailly overlying and extending substantially entirely along the articulations between the respective side wall panels and side flaps to define a medial portion of said cover sheet intermediate said rupturable cut score lines, said medial portion of said cover sheet being separable from the adjacent edge portions thereof, whereby removal of either of said end flaps from its respective end wall panel enables separation of said medial portion from

the remainder of said cover sheet to provide access to material stored in said tray.

4,524,871

RECEPTACLE FOR CONTAINING DISPOSABLE CLOTHS AND A STICK-LIKE CONTAINER

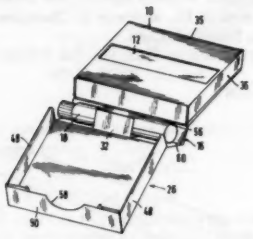
Max H. Klinger, Obere Ringstrasse 54, 4901 Hiddenhausen, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,512

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 8220848[U]

Int. Cl.³ B65D *37/00*

U.S. Cl. 206—233 **4 Claims**



1. A receptacle for containing disposable cloths and a tubular container, comprising:

a parallelepipedic box for containing disposable cloths, having a base and an upper surface with an opening;

a lid having sidewalls for closing the box;

a connecting member adjacent to a first sidewall of said box, hingedly connecting the base of said box to said lid;

a space for accepting a tubular container, defined by at least said first sidewall and said connecting member, said space having end openings closable by portions of the sidewalls of said lid; and

means for retaining a tubular container in said space, comprising a forced-in central segment of said connecting member.

4,524,872

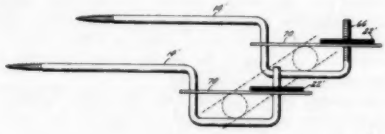
UNIVERSAL LOCKING DEVICE

Lewis W. Chamberlain, 79 Abbey Rd., East Hampton, Conn. 06424

Continuation-in-part of Ser. No. 248,953, Mar. 30, 1981, abandoned. This application Feb. 15, 1983, Ser. No. 466,379

Int. Cl.³ E05B *73/00*

U.S. Cl. 211—4 **4 Claims**



1. A combination support and securing device comprising:

elongated bar means, said bar means having a first linear portion which defines an axis and a second generally U-shaped portion extending from a first end of said linear portion, said U-shaped portion having a pair of spacially displaced legs with axes which are substantially perpendicular to said axis, a generally U-shaped object receiving channel being defined between said legs, a first end of a first of said legs being integral with the said first end of said linear portion, the second of said legs being provided with a threaded section extending from the free end thereof;

a flat plate, said plate being provided with a plurality of apertures, a pair of said apertures being spacially displaced and sized whereby said plate will loosely engage both of said legs of said U-shaped portion of said bar means, said plate having at least a third aperture located between an edge thereof and one of said apertures of said pair, said plate being movable along said legs of said bar means U-shaped portion to define an adjustable retaining member which bridges said object receiving channel; and

lock nut means, said lock nut means being provided with a central aperture, said central aperture having a thread which is complementary to the thread on said section of said bar means U-shaped portion second leg whereby said lock nut means may be installed on said bar means, said lock nut means further being provided with at least a first aperture positioned between said central aperture and the periphery of said lock nut means, said second aperture being alignable with said third aperture of said plate whereby the shackle of a lock may be passed through said aligned apertures; and

means for affixing said bar means to a support structure.

4,524,873

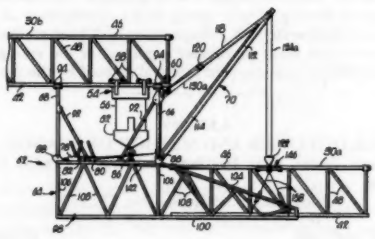
METHOD AND APPARATUS FOR DISASSEMBLING SECTIONAL BOOM OF TOWER CRANE AT TERMINAL HEIGHTS

Joseph L. McGowan, Harpenden, England, assignor to The Marley Cooling Tower Company, Mission, Kans.

Filed Nov. 26, 1982, Ser. No. 444,743

Int. Cl.³ B66C *17/04*

U.S. Cl. 212—177 **7 Claims**



1. In apparatus for disassembling a tower crane boom having an outermost boom section, at least one inboard boom section, means detachably interconnecting said boom sections, and a hoisting assembly suspended from said boom, the combination therewith of:

an elongated load bearing framework;

means cooperable with said hoisting assembly for shiftably coupling said framework to said inboard boom section for movement along the length thereof with the longitudinal length of the framework extending generally horizontally;

jib means on said framework for transferring said outermost boom section to said framework for support thereby when the section is detached from the boom for supporting of said outermost section by said framework; and

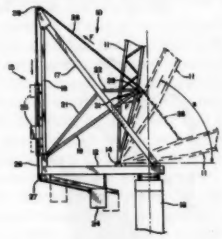
means on said framework for shifting said outermost section substantially horizontally relative to said framework to a position wherein the center of gravity of said outermost section is generally vertically aligned with the center of support of said framework by said hoisting assembly from said inboard boom section.

4,524,874

TOWER CRANE WITH OVERBOOMING PROTECTION

Klaas E. ten Broeke, Darien, Conn., and Manfred R. Kohler, Somers, N.Y., assignors to American Pecco Corporation, Milwood, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,248
Int. Cl.³ B66C *23/72*
U.S. Cl. 212—197 **5 Claims**



1. A crane having a counterweighted luffing boom with protection against overbooming, as by excessive wind force when the boom is at a steep angle close to vertical, comprising:
a supporting structure;
a luffing boom pivotally mounted on the supporting structure at a pivot point;
a series of sheaves mounted on the supporting structure;
at least one counterweight and a line connected to the counterweight and over the sheaves to a connection with the boom at a point spaced from the boom's pivot point;
a portion of the supporting structure supporting one of the sheaves adjacent to but spaced sideward of the path of travel of the luffing boom and adjacent to the path of travel of the connection point of the line on the boom, said one sheave being the first sheave over which the line travels from the connection point on the boom and spaced forward of the vertical boom position, such that the line and the counterweight pull on the boom tending to swing it upward in its path of travel until the line connection point on the boom passes said one sheave, after which the boom is oriented steeply and close to vertical and the line loops further around said one sheave and the line and counterweight then pull on the boom in the opposite direction, tending to retard further upward travel.

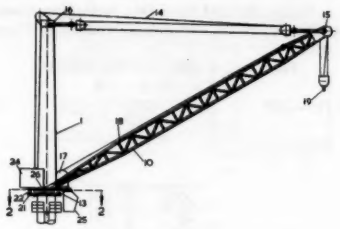
4,524,875

DERRICK CRANE

John R. Jamieson, Largs, Scotland, assignor to Vickers p.l.c., London, England

Filed Sep. 28, 1982, Ser. No. 425,876
Claims priority, application United Kingdom, Oct. 15, 1981, 8131083
Int. Cl.³ B66C *23/16*
U.S. Cl. 212—239 **8 Claims**

1. A derrick crane of the type having
a jib pivotally connected by way of a horizontal pivot to a movable member of a bearing device supported by a pedestal,
luffing gear arranged to raise and lower the jib about the horizontal pivot, hoisting gear arranged to raise and lower a load suspended from the jib and slewing gear arranged to swing the jib around the pedestal,
in which the pedestal is extended above the bearing device to form a mast and luffing cables of the luffing gear are connected between the top of the mast and the upper end of the jib,
and the bearing device comprises inner and outer bearing rings formed with registering part-circular annular grooves, a single ring of free-running balls which are a running fit in said annular grooves in said inner and outer bearing rings of which the inner bearing ring is connected to the mast, and the bearing device is supporting said jib vertically and is so positioned vertically on the mast with respect to the horizontal pivot by which the jib is connected to the outer bearing ring that the line of thrust of the jib through said horizontal pivot passes within the



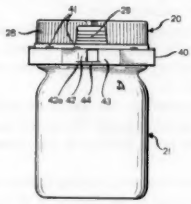
pitch circle diameter of said ring of balls during normal use whereby the vertical and horizontal component forces of the force exerted by said jib produce moments about the bearing centerline moment axis which oppose one another.

4,524,876

TAMPER INDICATING CHILD-RESISTANT PACKAGE

Maximillian Kusz, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 23, 1984, Ser. No. 643,590
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—224 **12 Claims**



1. A tamper indicating child-resistant package comprising
a container having a body and a neck,
said neck having at least one retaining bead with a notch therein and
a closure comprising a base wall and a peripheral wall,
said peripheral wall having at least one pair of locking lugs generally diametrically opposite to one another such that the closure can be rotated to orient one of the locking lugs with the notch on the container permitting the closure to be removed by an upward force in the area of the notch to produce a tipping movement,
said peripheral wall of said closure having an axially extending band connected to the lower end of the peripheral wall by a weakened line,
said band having an inner regular polygonal surface, said container having a portion at the area of juncture of the neck and body with an external polygonal surfaces complementary to the polygonal configuration on the interior of the band such that the closure must be applied with the lug in unoriented position to the notch by an axial movement with the lug snapping over the retaining bead, bringing the polygonal configuration of the band into engagement with the polygonal configuration of the shoulder on

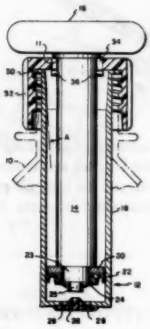
the container such that the closure cannot be rotated without breaking the band along the weakened line.

4,524,877

PRESSURIZING AND CLOSURE APPARATUS FOR CARBONATED BEVERAGE CONTAINERS

Willard A. Saxby, 285 Old Farm Dr., Newington, Conn. 06111, and Robert D. Pikula, 116 Johnny Cake La., Glastonbury, Conn. 06033

Filed Jan. 9, 1984, Ser. No. 569,569
Int. Cl.³ B65B *31/04*
U.S. Cl. 215—228 **6 Claims**



1. A pressurizing and closure apparatus for a carbonated beverage container comprising:
(a) a hollow cylinder having one open end,
(b) a threaded cap having a central opening, and abuts the open end of said cylinder,
(c) a piston mounted in said cylinder with one end of said piston extending through the central opening in said cap,
(d) a piston grip at the end of the piston extending outside of said cylinder,
(e) a seal mounted on the opposite end of said piston for sealing the piston against the inner walls of said cylinder,
(f) one or more ports located in the closed end of said cylinder,
(g) valve means mounted in the closed end of said cylinder which allows air to be displaced through said ports from said cylinder on the downstroke of the piston, and seals the ports on the upstroke of said piston,
(h) locking means on said piston for locking the piston in the downstroke position when the apparatus is stored within a carbonated beverage container.

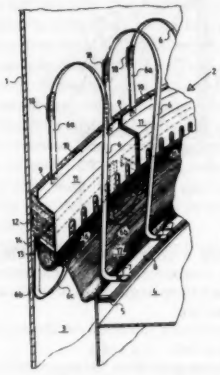
4,524,878

ASSEMBLY FOR SEALING AN ANNULAR GAP BETWEEN THE WALL OF A LARGE VESSEL AND A FLOATING COVER

Heinrich Imhof, Offenbach am Main, Fed. Rep. of Germany, assignor to Ingenieurbüro Imhof GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,233
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313564
Int. Cl.³ B65D *87/207*
U.S. Cl. 220—224 **17 Claims**

1. A sealing assembly for a large tank having a generally vertical tank wall and a movable floating cover for sealing an annular gap therebetween, comprising:
an annular outer sealing element adapted to be pressed against said tank vertical wall in sliding sealing engagement therewith;
a plurality of spring elements fastened at the circumference of said floating cover at uniform distances adjacent each other, said spring elements spanning said annular gap and operating at the free ends thereof to press by spring tension said outer sealing element against said vertical walls;
a sealing blanket which extends completely around said annular gap between said outer sealing element and said floating cover to cover said annular gap;
said spring elements being comprised of U-shaped spring stirrups produced from narrow strips and being fastened with a web end at the outer border of said floating cover;



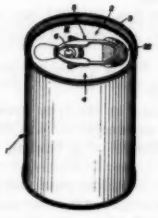
said spring stirrups including a free spring web with whose end said outer sealing element is rigidly connected, said free spring web being supported with said sealing element and a second contact point at said tank wall;
said contact point being spaced away from said sealing element in the vertical direction so that during all movements of said floating cover, the reaction forces of said tank wall acting at said contact points of said free spring webs constantly hold said free spring webs in a constant upright position.

4,524,879

CAN END POUR SPOUT AND PULL TAB CONSTRUCTION

Danny L. Fundom, and William A. Kirk, both of Massillon, Ohio, assignors to Van Dorn Company, Massillon, Ohio

Filed Jun. 18, 1984, Ser. No. 621,541
Int. Cl.³ B65D *17/36*
U.S. Cl. 220—273 **14 Claims**



1. In a steel can end of a type having a seam flange adapted to be connected by seam means to a can body, in which said can end has a recessed corner located below said seam flange with a flat circular panel extending inward from said recessed corner, in which a score line is formed in said panel defining a metal area to be torn from said panel by an aluminum pull tab having a ring portion and a nose porrtion, and in which said nose portion is riveted to said metal area so that pulling of the

pull tab tears said metal area from the panel to form a pouring opening, wherein the improvement comprises:

(a) a steel can end having an endless score line formed in said panel, in which said score line has a generally pear shape extending radially from a small rounded inner end located adjacent the center of the panel to a larger rounded outer end located adjacent the periphery of the panel, and has outwardly diverging straight sides connecting said inner and outer rounded ends to define the pouring opening to be formed in the can end panel;

(b) the nose portion of said aluminum pull tab riveted to said panel metal area has flat top and bottom panels and an enlarged rivet opening formed in said nose bottom panel, the nose bottom panel being integrally connected laterally at each side of said rivet opening through spaced inner nose shoulder walls directly with said nose top panel, said nose top and bottom panels and spaced shoulder walls converging to form a stepped tip, and said integral lateral connections of the nose bottom panel with the nose top panel strengthening and stiffening said flat nose bottom panel against bending between said rivet opening and said stepped tip when the pull tab is pulled to form a pouring opening in said can end panel;

(c) the can end panel metal area within the small rounded inner end of said pear-shaped endless score line is formed with concentric integral rivet means which extends through said enlarged rivet opening in said flat nose bottom panel and is riveted to said flat nose bottom panel, whereby the stiffened flat nose bottom panel is held at all times in contact with said can end panel metal area within said score line; and

(d) the ring portion of said pull tab integral with said nose portion has weakened connection with said nose portion to permit ready bending of the pull tab at said weakened connection when the pull tab is pulled to form a pouring opening in said can end panel;

(e) whereby the metal area within the endless score line may be completely torn from the can end by a person holding the can in one hand and grasping the tab pull ring portion with a finger or thumb of the other hand and pulling the tab ring portion upward and forward toward the person to first bend the pull tab at said weakened connection and then to initially rupture the score line behind and around the rivet means, accompanied by lever action of the contiguous pull tab nose flat bottom panel and contacted can end metal area within the score line applied by pull tab nose tip engagement with said metal area to form a bend in said metal area in front of said nose tip while tearing along the score line to such bend, and then by continuing forward pulling, completely tearing the metal area from the can end panel along the remainder of the score line to the rounded outer end of the score line to form a pouring opening.

4,524,880

CLOSURE DEVICE

Carl O. Danielson, Upsala; Bo B. Gustafsson, Alunda; Göte E. Richardsson, and Karl-Erik Lundh, both of Gislaved, all of Sweden, assignors to Pharmacia AB, Upsala, Sweden

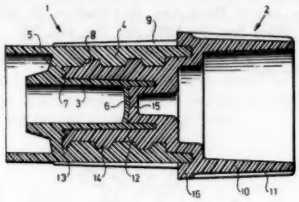
Filed Jul. 6, 1984, Ser. No. 628,591

Claims priority, application Sweden, Jul. 29, 1983, 8304207

Int. Cl.³ A61J *1/00*

U.S. Cl. 220—288 **9 Claims**

1. A closure device for fluid-tight closure of an opening of a fluid container or fluid conduit, comprising a casing part (1) for permanent connection to said opening, and a cap part (2) which is detachably connectable to said casing part, characterized in that said casing and cap parts (1,2) are molded in the same mold, one partially against the other, from two different thermoplastic materials having different melting points so as to permit relative movement of the mutually contacting surface portions thereof, and in that said casing part (1) comprises an internal sleeve portion (3), which communicates with said opening, and an external sleeve portion (4), which surrounds the internal sleeve portion (3) at a distance so as to form a substantially cylindrical hollow space therebetween, said cap part (2) comprising a tubular portion (12) dimensioned to sealingly intrude into said substantially cylindrical hollow



space, and coupling means (14,8) being provided for establishing a releasable mechanical coupling between said tubular portion (12) and at least one of said internal and external sleeve portions (3,4).

4,524,881

CAP FOR A TANK

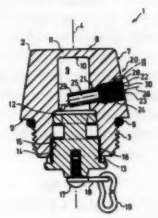
Dietmar Mierzwa, Korb, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 14, 1984, Ser. No. 640,697

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 8324849[U]

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—374 **14 Claims**



1. A cap for a tank such as the fuel tank of a motor-driven chain saw or the like, the tank having a threaded opening with a sealing surface about the periphery thereof, the cap comprising:

a grip housing defining a central axis and having a thread formed thereon for threadably engaging the threaded opening of the tank;

a seal mounted on the grip housing in a plane transverse to said central axis so as to be pressed tightly to the sealing surface when said grip housing is rotated about its central axis in threaded engagement with the threaded opening of the tank; and,

a ventilating arrangement for conducting air into and out of the tank when the cap is mounted thereon, the ventilating arrangement including:

bore means defining a longitudinal axis and located in said grip housing so as to cause said longitudinal axis to be transverse to said central axis, said bore means having a wall surface disposed in spaced relationship to said longitudinal axis;

a threaded member having a longitudinal axis and screwed into said bore means so as to cause said last-mentioned axis to be coincident with the longitudinal axis of said bore means; and,

said wall surface and the thread of said threaded member conjointly defining a helical channel communicating with

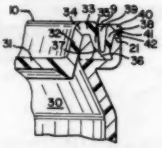
the interior of the tank when the cap is mounted thereon, whereby air can flow into or out of the interior of the tank.

4,524,882

MOLDED CONTAINER AND CLOSURE

John L. Buc, 144 N. Third Ave., Des Plaines, Ill. 60016

Filed Jun. 20, 1983, Ser. No. 505,799
Int. Cl.³ B64D *41/16*
U.S. Cl. 220—306 **23 Claims**



1. In a plastic container having a substantially cylindrical wall portion, a bottom member sealingly closing a lower end of said cylindrical wall portion of said container and an upper end of said cylindrical wall portion being open and defined by a closure receiving and sealing rim system, said rim system comprising:

a continuous annular resilient plastic bridge member formed integral with and extending around said upper end of said cylindrical wall;

an outer continuous annular resilient plastic rim formed integral with said bridge member and extending axially upwardly from said bridge member;

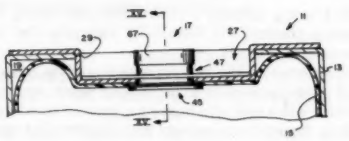
an inner discontinuous annular resilient plastic rim molded integral with said bridge member and extending axially upwardly from said bridge member, said inner rim being concentric with and radially inwardly spaced from said outer rim whereby said bridge member, said continuous outer rim and said discontinuous inner rim form a closure receiving and sealing container end which remains substantially radially annular and axially rigid.

4,524,883

STACKABLE CONTAINER

Walter R. Herring, Memphis, Tenn., assignor to Brockway, Inc., Richmond, Va.

Filed Jun. 27, 1983, Ser. No. 508,035
Int. Cl.³ B65D *21/00, 90/04*
U.S. Cl. 220—462 **14 Claims**



1. A container comprising:

(a) a substantially rigid box member having a top surface, having a hollow interior and having an aperture through said top surface;

(b) a flexible liner member for being positioned within said hollow interior of said box member and having a hollow interior and having an aperture therethrough; and

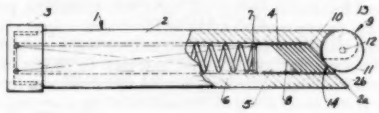
(c) attachment means for attaching said box member and said liner member to one another, said attachment means being fixed in the vertical plane with respect to said box member, said attachment means including a first lock means and a second lock means that snap together to secure said attachment means to said box member and to clamp said liner member therebetween, said first lock means including a tube member for extending through said aperture in said box member and said aperture in said liner member, said tube member of said first lock means having a first end for being positioned within said interior of said liner member and having a second end for being positioned above said aperture through said box member, said first end of said tube member of said first lock means including an outwardly extending portion for preventing said tube member of said first lock means from freely passing upwardly through said aperture through said box member, said second lock means coacting with said first lock means to lock said tube member of said first lock means to said box member and said liner member, said second lock means including a tube member having a first end and a second end and including an outwardly extending portion for preventing said second lock means from freely passing downwardly through said aperture through said lock member and for coacting with said outwardly extending portion of said first end of said tube member of said first lock means to position said attachment means relative to said box member to prevent vertical movement of said attachment means with respect to said box member, said second end of said tube member of said first lock means having an outwardly extending portion, said tube member of said second lock means and said liner member being secured between said outwardly extending portion of said first end of said tube member of said first lock means and said outwardly extending portion of said second end of said tube member of said first lock means, said first end of said tube member of said first lock means having a wedge portion and said first end of said tube member of said second lock means having a bevel portion for coacting with said wedge portion of said first lock means to securely hold said liner member therebetween.

4,524,884

BINGO COVER DISPENSER

William C. Myers, Box 331, Salt Fork Rd., Lawrenceburg, Ind. 47025

Filed Aug. 5, 1982, Ser. No. 405,331
Int. Cl.³ B65H *1/12*
U.S. Cl. 221—231 **10 Claims**



1. A device for dispensing generally flat circular covers used in playing the game of bingo comprising:

a magazine having an elongated tubular body of substantially oval cross sectional shape wherein the shorter dimension of said oval shape is less than the diameter of a cover, said magazine having one end configured to load a stack of covers into the magazine so that the covers rest therewithin in shingled relationship at inclined angles with respect to the longitudinal axis of the magazine with their outer peripheries substantially in contact with the inner wall of said tubular body, and an opening in the opposite end of the magazine for dispensing covers therefrom one at a time;

a cap removably attached to said loading end of the body; and

a manually operable wheel rotatably mounted on the dispensing end of the magazine adjacent said opening such that the outer surface of the wheel lies in abutting contact with the inclined surface of a cover presented at said dispensing opening, said presented cover being slidably retained between said wheel and the next in-line cover, said wheel when rotated operating to frictionally engage

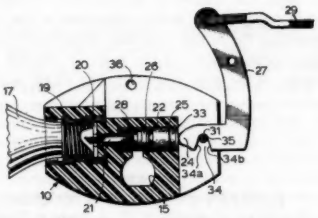
said presented cover and slide it outwardly at an oblique angle with respect to the longitudinal axis of the magazine from the stack of covers contained within the magazine until the presented cover clears said magazine, said dispensing device being configured so that said body may be grasped in one hand and said wheel operated by a rolling motion of the thumb of the same hand, said wheel being dimensioned so that said presented cover may be dispensed and completely clear the magazine with a single rolling motion of the thumb.

4,524,885

BREAK-AWAY INFLATOR

Harry L. Zimmerly, 9641 105th Ave. N., Largo, Fla. 33543

Filed Jan. 11, 1983, Ser. No. 457,241
Int. Cl.³ B63C *9/24*
U.S. Cl. 222—5 **12 Claims**



1. In an inflator for a gas inflatable article, the inflator having a body adapted to be mounted upon and sealed to the inflatable article, means for mounting a compressed gas-containing capsule upon the body and sealing it thereto, and manually operated capsule piercing means on the body including a piercing pin selectively movable forwardly toward the capsule to cause the forward end of the piercing pin to pierce the capsule and thus to release gas therefrom to flow into the inflatable article, said last named means including a cam having an active cam surface which gradually increases in radius from a low point to a high point, a pivot pin on the body, means on the cam for rotatably mounting it upon the pivot pin, resilient means constantly urging the piercing pin rearwardly so that its rear end engages and follows the cam, and a cam rotating lever attached at a first end to the cam and having a second, outer free end, the improvement wherein the means on the cam for rotatably mounting it upon the pivot pin has a seat receiving the pivot pin, said seat having a root in which the pivot pin is received when the cam and lever are in their ready at-rest position, and an open-ended passage in the cam extending generally radially outwardly from the seat therein, said passage being so disposed relative to the high point of the cam as to afford the free escape of the cam from the body of the inflator in a direction away from the pivot pin when the cam has been turned in the capsule piercing direction from its at-rest position suficiently for the piercing of the capsule to have been accomplished.

4,524,886

APPARATUS AND METHOD FOR IMPROVING THE ACCURACY OF A LOSS-IN-WEIGHT FEEDING SYSTEM

David H. Wilson, and James M. Loe, both of Scottsdale, Ariz., assignors to K-Tron International, Inc., Scottsdale, Ariz.

Filed Jan. 28, 1982, Ser. No. 343,143
Int. Cl.³ G01G *11/08*
U.S. Cl. 222—58 **9 Claims**

1. In a material feed system wherein material is discharged from a storage device and wherein material is added to the storage device for refill, apparatus comprising:

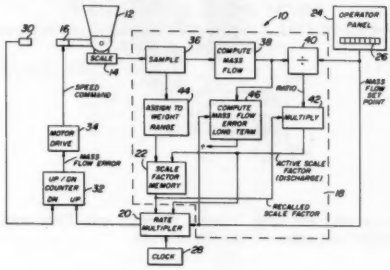
(a) means for sensing the weight of material in the storage device;

(b) a memory provided with storage locations each of which corresponds to one of a number of discrete weight increments, each weight increment being a predetermined fraction of the range of weight of material capable of being stored in the storage device;

(c) means for detecting whether material is being added to said storage device for refill;

(d) means for computing an active scale factor representative of the density of material being discharged from the storage device for each of said weight increments when no material is being added to refill the storage device;

(e) means for storing said active scale factor at the storage location corresponding to the weight increment within which the sensed material weight falls;



(f) means for recalling the stored active scale factor from the storage location in memory corresponding to the weight increment within which the sensed material weight falls during the time that material is being added to refill the storage device; and

(g) means responsive to the computed active scale factor for automatically varying the flow of material being discharged from the storage device when material is not being added to refill the storage device and responsive to said recalled active scale factor for varying the flow of material discharged from said storage device when material is being added to refill the storage device.

4,524,887

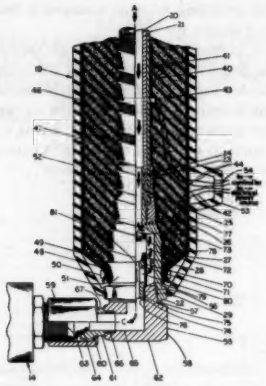
FILTER FOR ADHESIVE APPLICATOR

Eric H. Cocks, Ft. Lauderdale, Fla., assignor to Spraymation, Inc., Ft. Lauderdale, Fla.

Filed Dec. 22, 1982, Ser. No. 452,398
Int. Cl.³ B67D *5/62;* **B01D** *23/00*
U.S. Cl. 222—146.5 **10 Claims**

1. A filter arrangement adapted for use with an adhesive applicator and a heated adhesive supply line, said applicator being in flow communication with said supply line, comprising a housing located within the outlet end of said supply line, said housing having a flow channel therein permanently flow connected at a first end to said supply line and removably connected at a second end to said adhesive applicator, filter means within said housing for filtering the adhesive flowing through

said housing, and heating means comprising an electrical heater positioned around the outer surface of said housing for heating said adhesive flowing through said filter means to maintain said adhesive in a liquid state.



4,524,888

DISPENSER

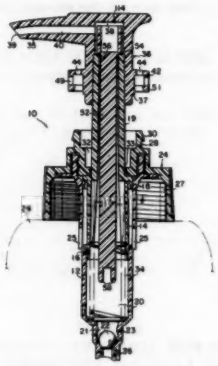
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,902

Claims priority, application Japan, Jul. 30, 1981, 56-119816; Jul. 31, 1981, 56-120097; Jul. 31, 1981, 56-120098; Jan. 13, 1982, 57-3684; Jan. 18, 1982, 57-5726; Feb. 12, 1982, 57-20794; Feb. 18, 1982, 57-25142; Apr. 6, 1982, 57-56870; Apr. 27, 1982, 57-70713

Int. Cl.³ B67B *5/00*

U.S. Cl. 222—153 **5 Claims**



1. A dispenser having a cap, a head, a piston attached to the head and a cylinder attached to the cap, and which is constructed so that it may be fitted onto a vessel through the cap and so that it may, in accordance with the sliding movement of the piston, suck up a liquid in the vessel into the cylinder through a primary valve and pressurize the liquid to cause the same to issue from the dispenser through a secondary valve, the dispenser further comprising:

child-proofing means including a protruded portion formed on the cap and having an engagement groove, and an engagement projection formed on the inner wall surface of the head and, by being rotated with the piston located at its depressed position, engaged with said engagement groove of said protruded portion to lock the piston made integral with the head to its depressed position;

one of an engagement projection and an engagement groove formed on or in, respectively, the outer wall surface of the cap;

the other of an engagement groove and an engagement projection formed in or on, respectively, the head so that it may be engaged with said engagement projection or engagement groove of the cap; and

means for preventing the rotation and rising movement of the head, said preventing means being formed on a virgin seal removably disposed between the cap and the head;

said preventing means for preventing the rotation and rising movement of the head including first engagement means engaged, by being moved in the direction of depressing the piston, with said engagement projection or engagement groove of the cap to prevent at least the rotation of the virgin seal relative to the cap, and second engagement means engaged, by being depressed in the direction of depressing the piston, with said engagement projection or engagement groove of the head to prevent at least the rotation of the head relative to the virgin seal.

4,524,889

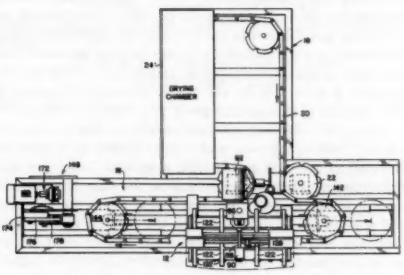
HOSIERY PROCESSING METHOD

John W. Glaze, Jr., Charlotte, N.C., assignor to Intech Corporation, Charlotte, N.C.

Filed Apr. 28, 1983, Ser. No. 489,313

Int. Cl.³ D06C *5/00*

U.S. Cl. 223—76 **19 Claims**



1. A method of setting synthetic fibers of hosiery within a low-volume flat steam chamber comprising the steps of:

(a) placing an article of hosiery made of synthetic fiber on a substantially flat form;

(b) moving the form and article into a flat steam chamber;

(c) sealing the periphery of the steam chamber to define an internal operative chamber with a volume less than 2.0 cubic feet;

(d) purging substantially all of the ambient air from the operative chamber in less than one second and setting the fibers of the article of hosiery in less than five seconds after substantially all of the ambient air is purged from the operative chamber by:

(i) injecting steam into said operative chamber at a line pressure above 50 psi;

(ii) holding the steam in the operative chamber until the fibers of the article of hosiery are set;

(e) opening the steam chamber;

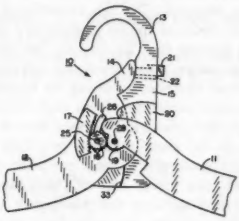
(f) removing the form and the article of hosiery from the steam chamber.

4,524,890

COLLAPSIBLE GARMENT HANGER

John D. Fulton, 117 Becker Ave., Rochelle Park, N.J. 07662

Filed Feb. 3, 1984, Ser. No. 576,551
Int. Cl.[3] A47J *51/10*
U.S. Cl. 223—94 2 Claims



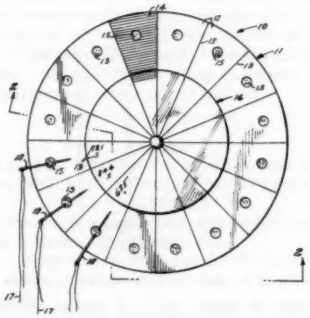
1. A collapsible garment hanger comprising: a support hook, a pair of pivotable arms, an axle, both of said arms connected to said axle for pivoting therearound independent of said support hook, a first of said pair of arms including a rack and the second of said arms including pinion drive means, a pinion, said pinion mounted for rotation about a stationary axle, said stationary axle extending through an arcuate slot in said first of said pair of arms, said pinion meshing with said rack and said pinion drive means for movement relative to said rack, said first arm including an extension lever, said lever having a latch means and said support hook having a neck with an opening therethrough for reception of said latch means to maintain said arms in an extended position and upon release of said latch means from the neck opening, the garment hanger being collapsible whereby said arms can overlap for compact storage.

4,524,891

NEEDLE KEEPER DEVICE

Rosemary A. Silva, 4400 Turf, El Paso, Tex. 79936

Filed Dec. 1, 1983, Ser. No. 557,195
Int. Cl.[3] A41H *31/00*
U.S. Cl. 223—109 R 1 Claim



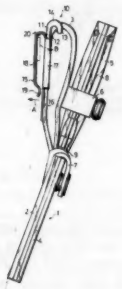
1. A needle keeper device, comprising, in combination, a relatively larger circular disc made of cardboard, and a relatively smaller circular, disposable paper disc, said discs being fastened concentrically together by a brad through the centers thereof, a plurality of equally and radially spaced segments defined upon said larger disc by means of inscribed radial lines upon the top face thereof, a single one of said segments being colored for defining a zero position of said larger disc, a circular opening through an exposed portion of each said segment, and a circular felt pad of the same diameter as said larger disc being fastened to the bottom side thereof and covering said openings; said openings being made along a circular row that is concentric with said larger disc, and a circular felt ring fastened concentrically to an underside of said larger disc, said felt ring extending across the center of each said opening, and each said opening being of a diameter whereby pressure of a person's finger against an underside of said felt ring causes only said felt pad to be pushed upwardly through said opening for receiving a needle slid upon said top face and across said opening; and an upper surface of said smaller disc being suitable for writing thereupon.

4,524,892

HANGER ATTACHMENT

Isamu Ozeki, 32, Yoshida-machi, Seki-shi, Gifu-ken, Japan

Filed Nov. 2, 1983, Ser. No. 547,856
Claims priority, application Japan, Jul. 8, 1983, 58-106680[U]
Int. Cl.[3] A45F *5/02*
U.S. Cl. 224—256 1 Claim



1. A hanger attachment for use with an article having an attachment loop to be hung from an attachment item, comprising:

(a) a support member having a groove receptive of the attachment item therein, said groove formed by bending said support member into a U shape with an inner side panel and an outer side panel parallel thereto, said inner side panel having its lower end bent toward said outer side panel and serving as a locking portion and said outer panel having a pair of cylindrical insertion tubes formed from the opposite edges thereof; and

(b) a hook member comprising a metal round rod which is first bent into a U shape having a horizontal support shank and a pair of insertion shanks extending vertically downward from opposite ends of said horizontal support shank, and which is further bent to provide a pair of positioning shoulders at the ends of said horizontal support shank, said hook member being detachably mounted on said support member by telescoping said insertion shanks, which have enlarged portions thereon, downwardly into said cylindrical insertion tubes so that said horizontal support shank is disposed above said insertion tubes, said horizontal support shank thereby removably supporting the attachment loop of the article such that the attachment loop hangs from said horizontal support shank and is prevented from shifting sideways thereon by said positioning shoulders.

4,524,893

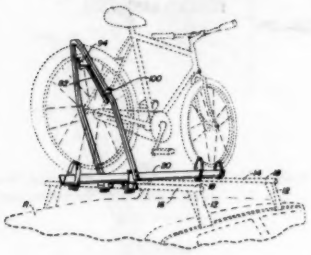
BICYCLE CARRIER

Stephen J. Cole, Arcata, Calif., assignor to Yakima, Inc., Arcata, Calif.

Filed Sep. 10, 1984, Ser. No. 648,950
Int. Cl.[3] B60R *9/10*
U.S. Cl. 224—319 6 Claims

1. A car top carrier for a bicycle comprising an elongate

rigid V-shaped channel adapted to receive the bicycle tires therein, means for mounting the channel on a car top in a substantially horizontal position oriented longitudinally of the car, a generally U-shaped stanchion including a pair of depending stanchion legs that have lengths approximately the diameter of the bicycle tire, means for attaching the lower extremities of respective said stanchion legs to said channel for pivotal movement about an axis substantially transverse to the channel, the upper portions of said stanchion legs being joined to one another by a crosspiece to space the upper portion of said stanchion legs apart from one another by a distance approximating the width of a bicycle tire, a clamping lever pivotally mounted on one of said stanchion legs and having a first portion that extends inward from said stanchion leg and confronts the crosspiece across an interval greater than the radial extent



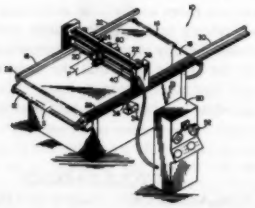
of the bicycle tire and rim, said clamping lever having a second portion rigid with the first portion and angularly oriented with respect thereto so that when the first portion is in a generally horizontal position said second portion resides substantially parallel to said stanchion leg, means for releasably locking said second portion into substantially parallel relation to said stanchion leg, and a clamping member secured to the distal region of said first portion of said lever, said clamping member including a high friction clamping piece for engaging the inner radial extremity of the bicycle rim and means for positioning the high friction member toward and away from the rim so that the rim and tire can be clamped between the crosspiece and the high friction member, said clamping member being releasable by disengaging said locking means and pivoting said clamping lever to move said clamping piece away from the bicycle rim.

4,524,894

METHOD AND APPARATUS FOR FORMING PATTERN PIECES

Claude W. Leblond, Enfield, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Dec. 29, 1982, Ser. No. 454,431
Int. Cl.³ B26F *3/00*
U.S. Cl. 225—2 **3 Claims**



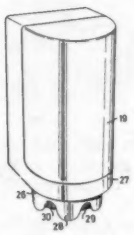
1. In an apparatus for cutting patterns from a pattern material while the material is held in a spread condition on a support, and a cutting tool and the material are guided relative to one another along a cutting path defined by the pattern periphery, an improved cutting tool comprising a rotatable tool support mounted a predetermined distance above the support surface for movement relative to the surface in a parallel direction, the rotatable support including a sleeve journaled by bearings for free rotation about an axis perpendicular to the material on the support surface, a cylindrical presser foot mounted coaxially within the sleeve and slidable relative to the sleeve along the perpendicular axis toward and away from the support surface; resilient means operatively connected with the cylindrical presser foot for urging the lower end of the presser foot upwardly away from the support surface and material supported thereon, a cutting bit formed from a hard cylindrical member projecting from and fixedly mounted in the lowr end of the cylindrical presser foot in perpendicular relationship with the sheet material to rotate with the foot about the axis perpendicular to the material for alignment with the cutting path, the lower end of the cylindrical member having two ground surfaces intersecting in a sharp cutting edge, which edge extends downwardly toward the support surface at an angle to the perpendicular axis from an upper point at one side of the member and the perpendicular axis to a lowermost point at the opposite side of the member and axis, the cylindrical member projecting from the foot at the lowermost point by a limited amount equal to the desired depth of cut, whereby the cutting bit is mounted relative to the perpendicular axis of rotation of the sleeve for castering movement into alignment with the cutting path when the bit is pressed into cutting relationship with the pattern material and advanced during a cutting operation, and actuator means for urging the cylindrical presser foot and the cutting bit downwardly into cutting engagement with the pattern material in opposition to the resilient means to penetrate the bit into the material up to the lower end of the presser foot during cutting.

4,524,895

HOLDER FOR PAPER ROLL WITH CENTRAL DISPENSING OF THE PAPER

Bertil Lundén, Hovas, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

Filed Mar. 15, 1983, Ser. No. 475,632
Claims priority, application Sweden, Apr. 1, 1982, 8202091
Int. Cl.³ A47K *10/36*
U.S. Cl. 225—19 **4 Claims**



1. A holder for paper rolls with central dispensing of the paper from the interior of the roll, said roll comprising a housing adapted to be mounted on a supporting surface and which has an end wall having a dispensing opening for the paper web, about which opening there is an at least substantially cylindrical tearing means for the paper web, said tearing means projecting from the end surface and having at its outer end sharp, substantially pointed tearing teeth for tearing off the paper web, the tearing means having at its outer end a plurality of spaced protective projections which extend beyond the sharp, substantially pointed tearing teeth, at least one of which teeth is disposed between adjacent protecting projections, said projections having inclined surfaces to protect the user's hand and fingers from the sharp teeth, said protective projections having

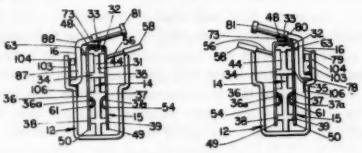
substantially sine-wave-shaped free edges with a wave amplitude substantially greater than the length of the tearing teeth.

4,524,896

REVERSIBLE STAPLE FEEDER SHOE AND DOOR SYSTEM FOR THE MAGAZINE OF A STAPLE DRIVING TOOL

Robert F. Morrell, Jr., Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Oct. 31, 1983, Ser. No. 546,927
Int. Cl.³ B25C *5/02, 5/06;* **B27F** *7/00*
U.S. Cl. 227—126 **8 Claims**



1. A magazine for use with a staple driving tool comprising a reversible feeder shoe and door system enabling set-up of said tool for one of right and left-hand loading, said tool being of the type having a body, a driver, a guide body having a drive track for said driver and a magazine, said magazine being of the top-side loading type and comprising a rail terminating at its forward end at said guide body, a row of staples slidably mounted in straddling fashion on said rail, a feeder shoe slidably mounted on said rail behind said row of staples, means to constantly urge said feeder shoe forwardly so that the forwardmost staple of the row is located in said drive track and a door swingable between an open position and a closed position overlying said rail to prevent inadvertent dislodgement of said staples therefrom, resilient means to bias said door to its closed position, said feeder shoe having a substantially symmetrical inverted U-shaped body having a base portion and downwardly depending sides so sized as to straddle said rail, said feeder shoe having an operating handle extending laterally from one of its sides by which it may be shifted rearwardly to a retracted position on said rail, said shoe being reversibly mountable on said rail such that its operating handle can extend to the left of said rail or to the right of said rail, said door being of reversible configuration and being mountable in parallel-shaped relationship to either side of said rail.

4,524,897

ELECTRICALLY DRIVEN TACKER OR THE LIKE FOR DRIVING FASTENING ELEMENTS INTO A WORKPIECE

Rainer Bachmann, Hohenstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 30, 1983, Ser. No. 537,803
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236748
Int. Cl.³ B25C *1/06*
U.S. Cl. 227—131 **19 Claims**

1. An electrically driven tacker for driving fastening elements into a workpiece, comprising:

a housing;

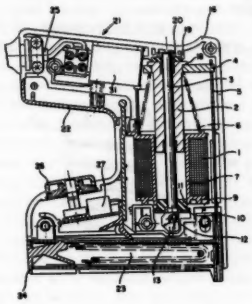
a driving element for impacting onto and driving a a fastening element;

a solenoid mounted in said housing and having an armature drivingly connected to said driving element;

means for adjusting the length of the operating stroke of said armature whereby the drive-in depth of the fastening element can be adjusted;

a guide rod upon which said armature is slidably mounted; said driving element being spaced from and parallel to said guide rod;

one end of said guide rod being located by said housing and the other end of said guide rod engaging said adjusting means; and



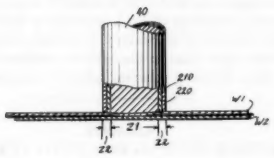
said armature moving towards and being stopped by said adjusting means during driving-in of the fastening element.

4,524,898

APPARATUS FOR PREVENTING STEP-EDGE SHEARING DURING ULTRASONIC WELDING

Theodore A. Renshaw, North Babylon, N.Y., assignor to Fairchild Industries, Inc., Chantilly, Va.

Filed Apr. 12, 1983, Ser. No. 484,189
Int. Cl.³ B23K *20/10*
U.S. Cl. 228—1.1 **6 Claims**



1. Apparatus for preventing step-edge shearing during ultrasonic welding with ultrasonic vibratory spot welding apparatus of the type having a welding tip adapted to introduce high frequency lateral vibratory energy into at least two workpieces in order to effect a weld therebetween and a complimentary anvil comprising means for applying coaxial pressure against said workpieces, said pressure applying means comprising at least one shield positioned about and with the inner surface thereof in continuous contact with the surface of either or both the anvil and welding tip, said shield including both an inner and an outer layer with the inner layer comprising an organic material.

5. Apparatus for preventing step-edge shearing during ultrasonic welding with ultrasonic vibratory spot welding apparatus of the type have a welding tip adapted to introduce high frequency lateral vibratory energy into at least two workpieces in order to effect a weld therebetween and a complimentary anvil comprising means for applying coaxial pressure against said workpieces, said pressure applying means comprising at least one shield positioned about and with the inner surface thereof in continuous contact with the surface of either or both the anvil and welding tip, said shield including both an inner and an outer layer with the inner layer comprising at least two layers of metallic material.

4,524,899
METHOD OF MANUFACTURING VENT ELEMENT

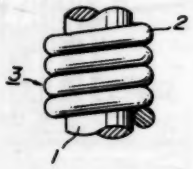
Masao Hirabayashi, Kawagoe, Japan, assignor to Tokyo Sintered Metal Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,694

Claims priority, application Japan, Jul. 31, 1981, 56-119283; Jul. 31, 1981, 56-119284; Jul. 31, 1981, 56-119285; Dec. 24, 1981, 56-208037

Int. Cl.³ B21D *39/04*

U.S. Cl. 228—173.2 **5 Claims**



1. A method of manufacturing a vent element having a plurality of small pores extending therethrough in parallel, comprising winding at least one wire rod in at least one layer spirally around and in contact with each of a plurality of core rods to form secondary wire rods each having a plurality of windings, said at least one wire rod having a melting point higher than that of said core rods, assembling a plurality of said secondary wire rods into a bundle by inserting the secondary wire rods into a hollow tubular element with interspaces between the secondary wire rods, plastically working the hollow tubular element and the bundle to reduce the diameter of the hollow tubular element and the bundle, and heating the bundle of secondary wire rods to a temperature which exceeds the melting point of the core rods but does not melt the wire rods thereby to melt the core rods, whereupon the molten core rods infiltrate between the windings of the secondary wire rods and also the interspace between the secondary wire rods thereby to bond adjacent windings of each secondary wire rod together, to bond the bundle of secondary wire rods together, to bond the secondary wire rods to the hollow tubular element and to form one pore at every position where a core rod was.

4,524,900
TWO-PIECE SLIDING BOX WITH TEAR STRIP SEPARATION

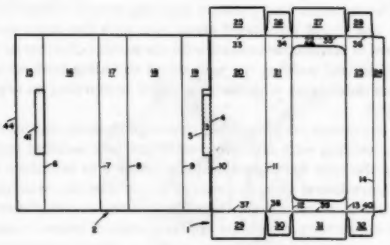
Arvo Salminen, Kauttua, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Aug. 17, 1983, Ser. No. 524,034

Claims priority, application Finland, Aug. 30, 1982, 822992

Int. Cl.³ B65D *5/38*

U.S. Cl. 229—19 **3 Claims**



1. A container comprising an inner box and an outer box, said container being formed from a single blank having a first portion adapted to form the outer box and a second portion adapted to form the inner box, said inner and outer box being detachably attached to each other, the first blank portion comprising serially an attachment flap, a bottom panel, one side panel, an upper panel and another slde panel, the second blank portion comprising serially, a bottom panel, one side panel, an upper panel, another side panel and an attachment flap, each of said bottom panel, said side panels and attachment flap of the second blank portion having end flaps extending therefrom at opposite ends thereof, said panels of the first blank portion and said panels of the second blank portion being defined by longitudinal fold lines, said container having been assembled by folding the second blank portion and the first blank portion along said longitudinal fold lines sequentially in the same direction and fixing the attachment flap of the outer box to the last side panel of the outer box, a tear strip located between the bottom panel of the inner box and the last side panel of the outer box, said tear strip being shorter than the longitudinal fold lines, said tear strip having two edges, one edge coinciding with the longitudinal fold line between the bottom panel of the inner box and the last side panel of the outer box, a slot in the attachment flap of the first blank portion, an opening in the upper panel of the inner box, said slot overlapping the tear strip in the assembled container.

4,524,901
SLIDING TWO-PIECE BOX WITH TEAR STRIP

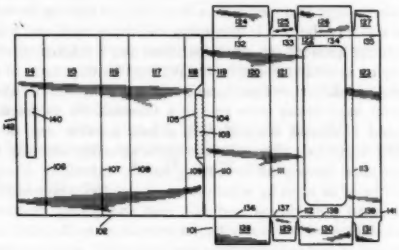
Kyosti Tikka, Kauttua, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Division of Ser. No. 524,034, Aug. 17, 1983,. This application Dec. 27, 1983, Ser. No. 565,404

Claims priority, application Finland, May 12, 1983, 831659

Int. Cl.³ B65D *5/38*

U.S. Cl. 229—19 **1 Claim**

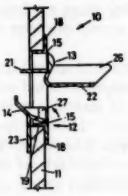


1. A container comprising an inner box and an outer box, said container being formed from a single blank having a first portion adapted to form the outer box and a second portion adapted to form the inner box, said inner and outer box being detachably attached to each other, the first blank portion comprising serially an attachment flap, a bottom panel, one side panel, an upper panel and another side panel, the second blank portion comprising serially, an attachment flap, a bottom panel, one side panel, an upper panel and another side panel, each of said bottom panel said side panels of the second blank portion having end flaps extending therefrom at opposite ends thereof, said panels of the first blank portion and said panels of the second blank portion being defined by longitudinal fold lines, said container having been assembled by folding the second blank portion and the first blank portion along said longitudinal fold lines in the same direction sequentially and fixing the attachment flap of the outer box to the last side panel of the outer box, a tear strip located between the attachment flap of the inner box and the last side panel of the outer box, said tear strip being shorter than the longitudinal fold lines, a slot aligned with the tear strip in the attachment flap of the first blank portion, said tear strip being located a distance apart from the adjacent fold lines, said slot being longer than the tear strip, an opening in the upper panel of the inner box.

4,524,902
CARTON HANDLE

John K. Mortimer, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty. Ltd., St. Marys, Australia

Filed Aug. 15, 1983, Ser. No. 523,157
Claims priority, application Australia, Aug. 23, 1982, PF5518
Int. Cl.³ B65D 5/46, 25/22, 25/28
U.S. Cl. 229—52 A 6 Claims



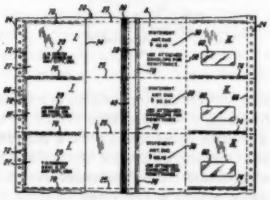
1. A carton handle comprising a monolithic moulding of polymeric material which, in its as-moulded mode, comprises a base portion, a pair of hinged portions, a pair of parallel hinge webs joining respective said hinged portions to the base portion, retaining flanges on the base portion and also on respective said hinged portions, and interengageable latch means on said hinged portions,

the shapes and dimensions of said hinged portions being such that, upon insertion in an aperture in a carton wall, the hinged portions are movable to respective positions wherein their retaining flanges lie contiguous with one surface of said carton wall while the base portion flanges lie contiguous with the opposite surface thereof, and said latch means interengage with one another and thereby inhibit release of said portions from their said respective positions.

4,524,903
ONE-PIECE TWO-WAY MAILER UNIT

F. Leo Vath, Brookville, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Mar. 19, 1984, Ser. No. 590,840
Int. Cl.³ B65D 27/06
U.S. Cl. 229—73 8 Claims

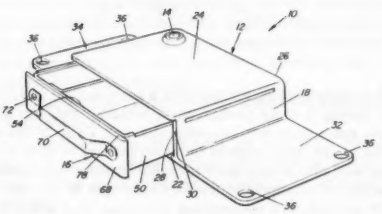


1. A one-piece two-way mailer unit comprising a single sheet of paper-like material having a predetermined width and length, the sheet having an inner surface and an outer surface and being folded at the middle of its length along a center fold line to define a first part and a second part, the inner surface of the first part opposing the inner surface of the second part and having a receiver's name and address information portion, the second part of the sheet having a window through which the receiver's name and address information portion is visible, the second part having a first severance line extending across its width and spaced parallel to the fold line to define therebetween a receiver's personalized information portion on the first surface, the first part having a second severance line extending across its width in close parallel spaced relation to the center fold line to define a connecting portion, the first part having a fold line across its width adjacent the receiver's name and address information portion, adhesive material attaching the inner surface of the first part to the inner surface of the second part in the connecting portion and also to form a pocket region at least partially encompassing the receiver's name and address information portion and the window with the pocket region being open along the fold line on the first part, the outer surface of the second part being adapted to carry postage information, the outer surface of the first part having a sender's name and address information portion between the connecting portion and the fold line on the first part, the single folded sheet thus being mailable to a receiver whose name and address appears through the window, the sheet being severable by the receiver along the first and second severance lines to separate and remove the receiver's personalized information portion of the second part and to create a return envelope with a flap portion extending from the pocket region, the flap portion being foldable along the fold line on the second part to cover at least a portion of the receiver's name and address to provide for mailing the return envelope to the sender's name and address.

4,524,904
VAULT

Lionel Massé , 578 Notre Dames St., Embrum, Ontario K0A 1W0, and Richard L. Boisvert, 4 Place Radisson, Apt. 103, Hull, P.Q., both of Canada

Filed Jun. 7, 1982, Ser. No. 385,882
Int. Cl.³ E05G 1/00
U.S. Cl. 232—7 2 Claims



1. A paper currency vault for use in a vehicle, comprising,

a housing having a pair of opposed, generally rectangularly shaped, substantially parallel end walls, a pair of relatively closely spaced, substantially parallel top and bottom walls which extend between said end walls in substantially perpendicular relation to said end walls, a side wall which extends between said top and bottom walls and said end walls, said top and bottom walls, said end walls and said side wall cooperating to define a generally rectangular chamber having an opening along one side thereof, and an elongated, narrow slot in one of said end walls opening into said chamber, said slot being substantially parallel to said top and bottom walls and exceeding the width of said paper currency;

a box shaped paper currency receptacle having a rectangular bottom wall and two pairs of opposed side walls extending substantially perpendicularly from the marginal edges of said receptacle bottom wall, an open upper end and an interior partition extending between a pair of said receptacle

side walls, said partition, said pair of side walls between which said partition extends, and another of said receptacle side walls defining a second, rectangular chamber for receiving and storing paper currency therein in a folded condition wherein said currency is folded about a transverse fold line, said receptacle being disposed in said chamber of said housing and being slidable therein between a closed position whereat one of said side walls of said receptacle closes said opening of said housing chamber and the interior of said receptacle is inaccessible from the exterior of said slot and an opened position whereat the interior of said receptacle is accessible for removal of paper currency therefrom, said receptacle having a width parallelling said slot and exceeding the width of said paper currency and a length exceeding one half the length of said paper currency, an aperture in one of said receptacle side walls alignable with said slot in said closed position of said receptacle for communicating to said chamber paper currency fed through said slot, and a separable end plate secured to said one receptacle side wall closing said opening; and

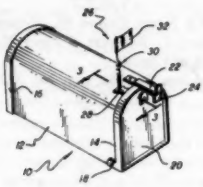
a key operated lock secured to the top wall of said housing and extending into said chamber, said lock having a latch member movable between a latching position and non-latching position and said receptacle having a latch surface engageable with said latch member in said latched position of said latch member and said closed position of said receptacle.

4,524,905

MAIL BOX SIGNAL DEVICE

Robert M. Crist, R.D. #4, Box 185, Oswego, N.Y. 13126

Filed Mar. 12, 1984, Ser. No. 588,398
Int. Cl.³ B65D *91/00*; A47G *29/12*
U.S. Cl. 232—35 **1 Claim**



1. A signal device for use with a conventional outdoor mail box having a body portion with bottom, rear, top and side walls, and a front wall hingedly attached along its lower edge to the lower, front edge of the body portion bottom wall, said front wall providing a door movable between open and closed positions with respect to the forward edges of the walls of the body portion, and cooperating frictional latch members, one fixedly attached to the body portion adjacent the forward edge of the top wall and the other to the door adjacent its upper edge when in the closed position, said signal device comprising, in combination:

(a) a clip member formed of a unitary strip of metal bent upon itself to provide upper and lower portions connected at the band and having a closely superposed normal position with limited flexibility to permit said upper and lower portions to be spread apart for insertion of said clip member on said forward edge of the top wall of said body portion in closely spaced relation to said one latch member, a central portion of said clip member at the bend between said upper and lower portions being removed to provide a cut-out area between two portions of said bend, said upper portion having a through opening adjacent the end opposite said bend;

(b) a coil spring element having a lower end inserted into said opening in said upper portion of said clip member, the successive coils of said spring being wound in contacting relation for a first portion of the length of said spring extending from said lower end, said spring being attached to said clip member by engagement of said upper portion thereof being engaged between two successive coils of said spring near said lower end, the coils of said spring being expanded to significantly spaced relation for a second portion of the length of said spring extending upwardly from said first portion, and said spring being bent to a substantially linear portion extending upwardly from said second portion to an upper terminal end, the normal, unflexed position of said spring extending upwardly from said clip member along a substantially linear axis through said first and second portions and along said linear portion; and

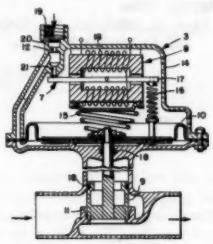
(c) flag means attached to said linear portion of said spring adjacent said upper terminal end, the relative dimensions and positions of said clip member, coil spring and flag means being such that said spring may be flexed away from said normal position to place said device in a set position wherein the axis of said spring is curved, said second portion of said spring is positioned in said cut-out area of said clip member, and said flag means is positioned inside said box body portion, said device being retained in such position by placing said door in said closed position to retain said second spring portion between said door and said forward edge of the top wall of said body portion without direct engagement therebetween, said spring returning to said normal position upon opening of said door.

4,524,906

TEMPERATURE CONTROL VALVE AND SENSOR/CONTROLLER THEREFOR

Richard L. Kenyon, Irvine, and Calvin E. Kempton, Laguna Hills, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 173,660, Jul. 29, 1980, abandoned, which is a continuation of Ser. No. 869,255, Jan. 13, 1978, abandoned. This application Dec. 10, 1982, Ser. No. 448,691
Int. Cl.³ G05D *23/00*; F16K *31/12*
U.S. Cl. 236—12.11 **14 Claims**



1. An automatic process control system comprising control valve means providing a variable area orifice to change the rate of flow of a control agent to maintain a desired condition in the process, and a sensor/electronic controller of which the sensor detects a departure from the desired condition to produce an error signal which is processed by the controller to provide an output signal to said control valve means, said control valve means including a diaphragm actuated modulating valve, the diaphragm of which separates respective chambers on opposite sides thereof, means for providing system fluid to both said chambers for establishing a pressure differential on opposite sides of said diaphragm, said means for providing including motor operated pilot valve means for directing and controllably metering fluid flow to one of said chambers in response to actuation of said motor by said output signal to change the rate of flow of said control agent to restore the process to the desired condition, and means for venting system fluid from said one chamber to allow for such directed and

controlled fluid flow to said one chamber, and said modulating valve having position feedback spring means bearing on said pilot valve means to reach a force equilibrium with the motor force acting on said pilot valve means when said modulating valve has stroked an amount proportional to said output signal.

4,524,907

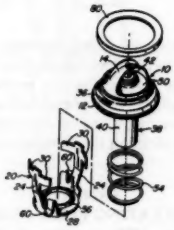
AUTOMOTIVE THERMOSTATIC FLUID CONTROL VALVE DEVICE

Backman Wong, Wayland, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Continuation of Ser. No. 513,803, Jul. 14, 1983, abandoned, which is a continuation of Ser. No. 318,321, Nov. 5, 1981, abandoned. This application Jul. 30, 1984, Ser. No. 635,540

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—34.5 **4 Claims**



2. A thermally responsive fluid control valve device for a fluid conduit system provided with a first engagement surface and an axially spaced generally parallel second engagement surface, the fluid control device being of the type provided with a first frame member, the first frame member including an annular valve seat portion forming a fluid port and a bridge portion integral with the annular valve seat portion and extending across the fluid port, the annular valve seat portion being adapted to engage the first engagement surface of the fluid conduit system, a closure member engageable with the annular valve seat portion of the first frame member to close the fluid port, a thermally responsive actuator member having a portion engaging the closure member and a portion engaging the bridge portion of the first frame member, a coil spring encompassing a portion of the thermally responsive actuator member, the improvement comprising: a second frame member consisting of a single piece of sheet metal material including a ring portion and a plurality of leg portions integral with the ring portion and extending from the ring portion, a plurality of foot portions integral with the ring portion and the leg portions, the foot portions being circumferentially offset on the ring portion, each of the foot portions being positioned between two of the leg portions, the leg portions of the second frame member being attached to the annular valve seat portion of the first frame member to form a frame unit adapted to be positioned within a fluid conduit system with the foot portions extending outwardly from the ring portion and being adapted to engage the second engagement surface of the fluid conduit system, the coil spring engaging the closure member and the ring portion of the second frame member and urging the closure member toward the valve seat portion of the first frame member.

4,524,908

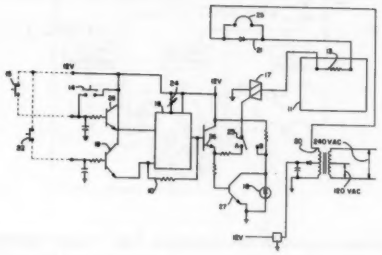
SET-BACK THERMOSTAT ASSEMBLY

John Marshall, 1300 Spear St., South Burlington, Vt. 05401, and Henry B. Clark, Jr., Box 117, Underhill Center, Conn. 05490

Continuation-in-part of Ser. No. 285,016, Jul. 20, 1981, abandoned. This application Nov. 15, 1983, Ser. No. 460,546

Int. Cl.³ F23N *5/20*; G05D *15/00*

U.S. Cl. 236—46 R **1 Claim**



1. An improved, set back thermostat assembly, having a thermostat, an electrical, (energizable) controllable heat emitting element in thermally-effective juxtaposition relative to said thermostat, and an electrical circuit, connected to said element, said circuit comprising means for (conducting) effecting and interrupting electrical current through said element electively (energizing and) de-energizing said element, wherein the improvement comprises:

assembly means of unitized construction;

means coupled to said element and said circuit operative in a first normal mode for enabling a (given) controlled amount of current to be conducted through said element, and operative in a second mode for (enabling an amount of current differing from said given amount to be conducted through) electively and randomly disconnecting said current from said element;

means enabling said assembly to accommodate a plurality of voltages; (and)

electrically-interconnected means for electively and ramdomly disconnecting electrical current from said circuit (initiated on the specific site.) initiated on said unitized assembly;

said element-coupled means comprises a diode in series connection with said element;

said element-coupled means further comprises a disengageable jumper connection connected in parallel with said diode;

said current effecting and interrupting means comprises a solid-state, electronic switching means in series connection with said element;

said switching means comprises a solid-state electronic switch, a source of electrical potential, and means electrically interconnecting said source and said switch;

said electrically-interconnecting means includes adjustable means for controlling the amount of time during which electrical current is interrupted through said element;

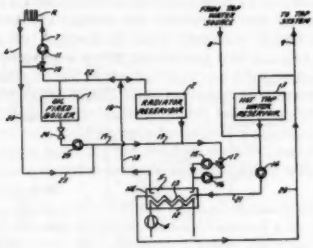
said electrically-interconnecting means further includes means for visually signalling an interruption of current from conduct thereof through said element thereby indicating said thermostat assembly is operating without setback; and

said signalling means comprises a light-emitting diode.

4,524,909
APPARATUS FOR PRODUCTION OF HOT TAP WATER

Ingemar Persson, Tallvägen 3, S-562 02 Taberg, Sweden

Filed Nov. 14, 1983, Ser. No. 551,042
Claims priority, application Sweden, Nov. 15, 1982, 8206471
Int. Cl.³ G05D 23/00
U.S. Cl. 237—2 B 4 Claims



1. Heating apparatus for supplying heat to heat radiating means at desired times and in desired quantities and for heating tap water from an unheated source thereof for withdrawal at a tap system as hot tap water at desired times and in desired quantities, said heating apparatus comprising a heat pump having a compressor by which refrigerant is compressed and a heat exchanger having a refrigerant passage connected with the compressor and through which compressed refrigerant can flow, said heating apparatus being characterized by:

A. a reservoir for storage of radiator water;

B. means defining a raditor circuit in which said heat radiating means and said reservoir are connected and in which radiator water can circulate;

C. means in said heat exchanger defining

(1) a radiator water passage and

(2) a tap water passage, each of which is in heat transfer relationship with the other and with said refrigerant passage;

D. means connecting said radiator water passage with said reservoir in parallel with said heat radiating means and defining a heat transfer circuit wherein radiator water can circulate through the radiator water passage in bypass relation to the heat radiating means;

E. means communicating the tap water source with the tap system through said tap water passage to provide for heating tap water from both compressed refrigerant and radiator water; and

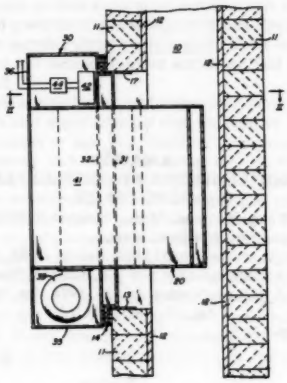
F. radiator water circulation controlling means comprising valve means and pump means arranged to provide for circulation of radiator water from the reservoir through each of said circuits substantially independently of circulation through the other.

4,524,910
HEATER USING HOT WASTE FLUE GASES

Larry J. Condon, 307 E. End Ave., Pittsburgh, Pa. 15221

Division of Ser. No. 199,580, Oct. 22, 1980, Pat. No. 4,363,442.
This application Sep. 13, 1982, Ser. No. 417,050
Int. Cl.³ F24B 7/00
U.S. Cl. 237—81 5 Claims

1. A method for heating a forced-air supply with sensible heat recovered from a hot stream of waste flue gases in a chimney or the like for supplying heat to a dwelling, the method including the steps of forming an access opening through a side wall of said chimney to the flow space therein for hot waste gases, securing a frame in a substantially airtight manner to the wall of said chimney to surround the access opening therein, selecting a heat exchanger to occupy a cross-sectional area of the chimney which substantially corresponds to the cross-sectional area of the access opening formed in the side wall of said chimney, using the access opening to arrange planar walls of a heat exchanger generally parallel to and within the flow space for hot waste gases in the chimney, supporting said heat exchanger by a housing attached to said frame to close the access opening in the frame in a substantially

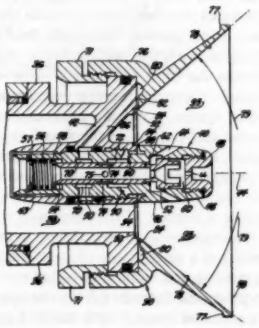


airtight manner, using the access opening along the inside of the housing facing the chimney for the flow of hot waste gases, feeding air from the housing into an enclosed heat exchange space between the planar wall of said heat exchanger for heating therein, and directing a heated discharge flow of air from the heat exchanger through the housing into the dwelling.

4,524,911
OSCILLATING FLOW NOZZLE

Edward J. Rozniecki, 31041 Angeline, St. Clair Shores, Mich. 48082

Filed Feb. 21, 1984, Ser. No. 581,521
Int. Cl.³ B05B 1/08
U.S. Cl. 239—101 16 Claims



1. A liquid spray nozzle comprising a liquid inlet passage means defining a flow axis; a liquid outlet passage means connected to the inlet passage means; said outlet passage means defining first liquid attachment surfaces diverging away from the flow axis in the downstream direction; an elongated hollow housing within the nozzle centered on the flow axis; said hollow housing defining second liquid attachment surfaces extending generally parallel to the flow axis; first flow deflector orifice means in the first liquid attachment surfaces; second flow deflector orifice means in the second liquid attachment surfaces; liquid pulse generation means within the hollow

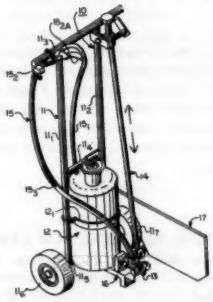
housing; a first control passage system between the pulse generation means and said first orifice means; and a second control passage system between the pulse generation means and the second orifice means, whereby the main liquid flow is deflected from the first attachment surfaces to the second attachment surfaces while the pulse generation means is delivering a control pulse to the first orifice means, and the main liquid flow is deflected from the second attachment surfaces to the first attachment surfaces while the pulse generation means is delivering a control pulse to the second orifice means.

4,524,912

AGRICULTURAL PORTABLE CHEMICAL APPLICATOR WITH PROTECTIVE SHIELD

William R. Jones, Crystal Springs, Miss., assignor to J/Mac Corporation, Jackson, Miss.

Filed May 23, 1983, Ser. No. 497,125
Int. Cl.³ B05B *15/04, 1/28;* **A01C** *15/00*
U.S. Cl. 239—150 **8 Claims**



1. An applicator for use by an operative in applying a liquid to plants or shrubs growing within the earth which comprises

a carriage, constituted of a frame provided with a pair of alternately disposed wheels mounted on an axle located at the lower end of said frame, and handle located at the upper end of said frame,

a bracket frame located on the lower end of the carriage, projected outwardly from the carriage frame,

a tank supported on said bracket frame, said tank being constituted of an outer shell with an upper opening within which a pump assembly can be removed for filling the tank with liquid, replaced after filling with the tank with liquid, and the pump activated to pressurize the liquid,

a spray nozzle assembly, inclusive of a pivotally movable spray nozzle operatively communicated with said tank via a conduit for the receipt of liquid therefrom mounted on the bracket frame at the lower end of the carriage frame, said spray nozzle of the spray nozzle assembly being pivotally mounted via a hinge element to the bracket frame, and means for actuation and movement of the spray nozzle via mechanism located in part upon the carriage frame handle, said means including an elongated shaft the lower end of which is pivotally mounted to said spray nozzle, and the upper terminal end of which is reciprocably mounted within a collar lock assembly located on the handle of the carriage frame whereby the elongated shaft can be reciprocably moved within the collar to change the direction of the spray nozzle, or locked in position within the collar lock assembly to fix the direction of the spray nozzle, and

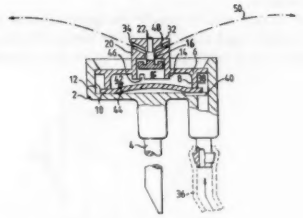
a guard of substantially planar shape mounted on the side of the carriage adjacent the spray nozzle such that the narrow edges thereof are vertically oriented, the inner flat side of the guard facing the spray nozzle of the spray nozzle assembly to restrict and control the area of application of the spray of liquid emitted from the spray nozzle, the narrow edges of the guard being aligned in the direction of forward movement of the carriage to minimize physical contact between the guard and the plants or shrubs through which the applicator is moved.

4,524,913

SELF-REGULATING SPRINKLER NOZZLE

Dan Bron, 36 Palmach St., Haifa, Israel

Continuation of Ser. No. 276,195, Jun. 22, 1981, abandoned.
This application Feb. 6, 1984, Ser. No. 577,309
Claims priority, application Israel, Jul. 2, 1980, 58176
Int. Cl.³ B05B *3/04*
U.S. Cl. 239—222.17 **10 Claims**



1. A self-regulating sprinkling nozzle attachable to a liquid-carrying line, comprising a cylindrical housing having a vortex chamber inside said housing, a vortex-producing inlet through which said liquid enters said vortex chamber, one wall being constituted by a first surface of a stretchable diaphragm and the opposite wall of said vortex chamber being constituted by a cover provided with a drive space communicating with said vortex chamber and having an aperture leading to the atmosphere, the second surface of said diaphragm being exposed to the pressure of the liquid in said liquid carrying line, said diaphragm being stretchable in response to variations in pressure between that in said liquid carrying line and that in said vortex chamber to vary the volume thereof and maintain the pressure in said vortex chamber constant, a spinner disposed in said drive space and entrained by said vortex propagated into said drive space, said spinner having a shaft which passes with substantial clearance through said aperture to permit liquid to flow therethrough, and a liquid-throwing member fixedly attached to the end of said shaft, and spun as a result of the action of said vortex on said spinner.

4,524,914

THROTTLING PINTLE-TYPE FUEL INJECTION NOZZLE HAVING AN IMPROVED INITIAL INJECTION CHARACTERISTIC

Nobuhiro Kaibara; Toshio Ida; Shinji Okuda, and Takayuki Motohashi, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,498
Claims priority, application Japan, Jan. 27, 1983, 58-10176[U]
Int. Cl.³ B05B *1/32;* **F02M** *61/06*
U.S. Cl. 239—452 **3 Claims**

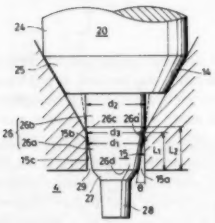
1. A throttling pintle-type fuel injection nozzle for use in a fuel injection valve having a nozzle holder and mounted in an internal combustion engine having at least one combustion chamber, said fuel injection nozzle comprising:

a nozzle body fixed to said nozzle holder of said fuel injection valve, said nozzle having an axial hole, a valve seating portion and a nozzle hole formed therein and succesively arranged in the order mentioned along an axis thereof, said nozzle hole having a cylindrical configuration and having one end remote from said combustion chamber of said engine and another end opening into said combustion chamber, said nozzle hole having a substantially constant diameter along the whole length thereof;

a nozzle needle mounted within said nozzle body, said nozzle needle having a guide portion slidably fitted in said axial hole of said nozzle body, a seating portion formed adjacent said guide portion and seatable on said valve seating portion of said nozzle body, a pressure-applying portion located between said guide portion and said seating portion, and a pintle formed adjacent said seating portion and disposed to be fitted through said nozzle hole of nozzle body;

said axial hole of said nozzle body having a guide hole in which said guide portion of said nozzle needle is slidably fitted, and a pressure chamber formed adjacent one end of said guide hole closer to said combustion chamber and disposed to be supplied with pressurized fuel, said pressure chamber being swelled radially outwardly of said guide hole and accommodating at least part of said pressure-applying portion of said nozzle needle;

said pintle of said nozzle needle having a conical portion having two ends, said conical portion being disposed such that one end of said conical portion is located slightly remoter



from said combustion chamber than is said one end of said nozzle hole, and another end of said conical portion is substantially on a level with said another end of said nozzle hole opening into said combustion chamber when said seating portion of said nozzle is in a position seated on said valve seating portion of said nozzle body, said conical portion of said pintle having a diameter gradually decreasing from said one end thereof to said another end thereof;

said conical portion of said pintle having an outer peripheral surface and said conical portion having a portion disposed to on a level with said one end of said nozzle hole when said seating portion is in said seated position, said portion of said conical portion having a diameter equal to the inner diameter of said one end of said nozzle hole;

whereby when said seating portion of said nozzle needle is in said seated position, said pintle and said nozzle hole define therebetween an annular gap gradually expanding from said one end of nozzle hole to said another end thereof, with said one end of said nozzle hole being positiviely closed by said outer peripheral surface of said conical portion of said pintle.

4,524,915

OPPOSED TYPE JET MILL

Takashi Yamagishi, Fujisawa, Japan, assignor to Turbo Kogyo Co., Ltd., Yokosuka, Japan

Continuation of Ser. No. 447,233, Dec. 6, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 660,964

Claims priority, application Japan, Feb. 6, 1982, 57-17893

Int. Cl.³ B02C *19/06*

U.S. Cl. 241—39 **5 Claims**

1. An opposed type jet mill comprising:

a pair of opposed injectors each having a nozzle for ejecting high pressure gas, said nozzles being aligned on a common axis in opposed relationship to each other;

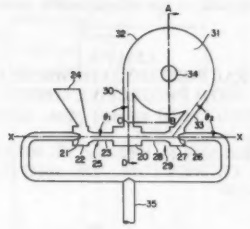
a grinding chamber between said opposed injectors;

feed means for feeding new raw material solely to one of said injectors;

grinding chamber discharge pipe means connected and oriented generally perpendicularly to said common axis of said nozzles for receiving a high speed flow of a mixture of ground material and gas from the grinding chamber;

an airflow classifying chamber connected to said grinding chamber discharge pipe means for receiving said mixture and separating coarse grains in the ground material;

recycle pipe means connected to said classifying chamber means for returning said coarse grains solely to the other



of said injectors for regrinding, said recycle pipe communicating with said other injector at an angle of 60 degrees or less with said common axis of said nozzles and in the direction of said other injector, whereby proper adjustment of the feed rate of new raw material into said one injector causes said mill to create a continuous high frequency tone.

4,524,916

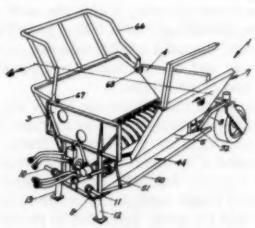
DISPERSING MACHINE FOR LARGE BALES

Richard E. Keyes, and John W. Dirksing, both of Cincinnati, Ohio, assignors to Finn Corporation, Cincinnati, Ohio

Filed Mar. 7, 1983, Ser. No. 472,971

Int. Cl.³ B02C *21/02*

U.S. Cl. 241—101 A **15 Claims**



1. A machine for dispersing the material contained in large bales upon the ground or the like, comprising:

a trough-shaped body having a front end, a rear end, a bottom, a stationary side and a movable side, wherein said movable side is pivotally connected between said front end and said rear end a fixed distance above said bottom forming a discharge opening;

a supporting framework which unifies said trough-shaped body elements in such a manner that said framework and said trough-shaped body are not capable of independent movement, said framework having wheels near said rear end and means for hook-up of the machine to a tractor;

a rotor centrally located near said bottom of said trough-shaped body, made up of a series of uniformly spaced, flat adjacent plates connected to a central shaft, tie rods connecting adjacent plates at positions equally distant about the periphery of said adjacent plates, hammer means pivotally connected to said tie rods between the adjacent plates and means for coupling said central shaft of said rotor to an external power source;

grate means overlying said rotor for holding the bale above

said rotor while still allowing said hammers to pass therethrough to engage and break up the baled material; and lift means connected to said movable side for moving said movable side only between a lowered, pick-up position in which said movable side wall contacts said ground, and a raised, operational position.

4,524,917

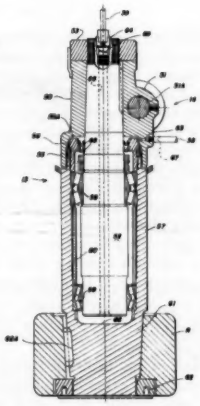
AIR SEAL AND LUBRICATION SYSTEM FOR ROLLER GRINDING MILLS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Mar. 3, 1983, Ser. No. 471,701

Int. Cl.³ B02C *15/04*

U.S. Cl. 241—101.2 **8 Claims**



1. In an air seal and lubrication supply system for a grinding roll assembly having a pivot support by which a grinding roll is mounted, the improvement comprising:

(a) a journal shaft non-rotatably mounted in the pivot support;

(b) a sleeve surrounding and spaced from said journal shaft, said sleeve having an open end spaced from the pivot support forming a joint space therewith;

(c) bearing means engaged between said sleeve and journal shaft;

(d) a grinding roll carried by said sleeve for rotating with said sleeve relative to said journal shaft;

(e) means for delivering lubricant through said journal shaft to said bearing means in said sleeve;

(f) means for delivering air through the pivot support for creating an air seal between said sleeve and said journal shaft at said joint space between said sleeve open end and the pivot support; and

(g) seal means in said sleeve in operative engagement with said journal shaft, said seal means being responsive to the delivery of air into said joint space for maintaining said seal means operative to retain lubricant in said sleeve.

4,524,918

FILAMENT WINDING MACHINE

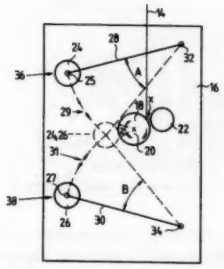
Markus Feusi, Winterthur; Josef Huber, Pfungen; Heinz Oswald, and Peter Pfyffer, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Aug. 26, 1982, Ser. No. 411,908

Claims priority, application United Kingdom, Sep. 17, 1981, 8128122

Int. Cl.³ B65H *54/02, 67/04*

U.S. Cl. 242—18 A **9 Claims**



1. A winder for thread comprising

a friction drive member rotatable about a longitudinal axis thereof to receive a thread thereon,

a first rotatable chuck movable along a first path between a rest position spaced from said friction drive member and a winding position adjacent said drive member for winding of a thread thereon,

a second rotatable chuck movable along a second path between a rest position spaced from said friction drive member and a winding position adjacent said drive member for winding of a thread thereon,

said paths being so disposed that a part on one chuck moving towards said winding position thereof intercepts a length of thread extending between said friction drive member and the other chuck moving away from said winding position thereof;

a headstock;

a pair of stationary support member in said headstock;

a shaft extending between and mounted in said support members;

a swing arm slidably mounted on said shaft for axial movement between said support member and for pivoting about a longitudinal axis of said shaft;

means connected to said swing arm for pivoting said swing arm about said axis of said shaft;

means connected to said swing arm for moving said swing arm axially of said shaft; and

said first chuck being mounted on said swing arm in cantilivered relation for pivoting about said shaft between said rest position and said winding position thereof.

4,524,919

MULTIPLE BOLT TURNING MACHINE

Claus Wehrmann, Extertal, Fed. Rep. of Germany, assignor to Lenze GmbH & Co. KG Aerzen, Aerzen, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,985

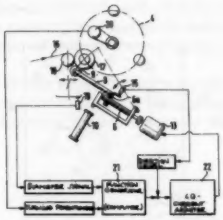
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205779

Int. Cl.³ B65H *19/20*

U.S. Cl. 242—67.1 R **9 Claims**

1. A multiple bolt turning machine comprising a winding star which is adapted to be rotated from one to the next of a plurality of bolt positions, at least one of said positions com-

prising a bolt winding position and at least one other of said positions comprising a bolt removal position, a feed roll adapted to engage a web of material being wound onto said bolt at said bolt winding position, first positioning means for shifting the position of said feed roll about a pivot axis spaced from and parallel to the axis of rotation of said feed roll as said winding star rotates to move a bolt from said winding position to said removal position thereby to maintain said feed roll in contact with the incoming web of material and in engagement with the exterior of said bolt during said movement of said



bolt, and second positioning means operable concurrently with said first positioning means for adjusting the distance between said pivot axis and the axis of rotation of said feed roll to maintain the angle of contact between said feed roll and said web of material substantially constant throughout the movement of said bolt between said winding and removal positions, said feed roll being mounted in a frame which is mounted for pivotal motion about said pivot axis, said second positioning means comprising motor means mounted for movement with said frame as said frame is pivoted about said pivot axis.

4,524,920

FILM CASSETTE

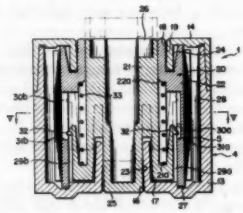
Atsushi Kidawara, and Kazunari Kobayashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,238

Claims priority, application Japan, Jul. 20, 1982, 57-126131; Aug. 10, 1982, 57-121213[U]; Aug. 10, 1982, 57-121214[U]

Int. Cl.³ B65D *85/67;* **B65H** *19/00*

U.S. Cl. 242—71.1 **11 Claims**



1. A film cassette comprising:

a cassette main body having a film supply portion and a film take-up portion;

said cassette main body including a case with a first aperture at one end thereof, a second aperture at the opposite end thereof, and a cover closing said first aperture, said cover having an aperture therein;

a spool arranged at said film take-up portion of said cassette main body, said spool comprising:

an outer cylinder around which a film is wound;

an inner cylinder which is slidable in an axial direction relative to said outer cylinder and which is rotatable with said outer cylinder, said inner cylinder having opposite ends, one of which is at said second aperture and the other of which is passable through said aperture in said cover to project outward; and

biasing means for biasing and moving said outer and inner cylinders relative to each other in the axial direction thereof to bias said inner cylinder into said outer cylinder and into said cassette main body; and

bearing means arranged at said film take-up portion of said cassette main body for rotatably supporting said spool, said bearing means including a pair of bearings formed at said cover and said case, respectively, of said cassette main body, said bearings each rotatably supporting respective opposite ends of said outer cylinder;

said inner cylinder being pushable at said one end thereof in the axial direction through said second aperture of said case to cause said inner cylinder to project outward from said aperture of said cover.

4,524,921

FISHING REEL

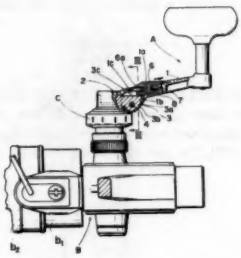
Kiyomi Ozaki, Fuchu, and Kikuo Tsunoda, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Mar. 8, 1983, Ser. No. 473,231

Claims priority, application Japan, Mar. 10, 1982, 57-33375

Int. Cl.³ A01K *89/00;* **G05G** *5/06*

U.S. Cl. 242—84.1 J **3 Claims**



1. In a fishing reel having a drag knob arranged near a handle mounting end of a handle shaft journalled on a reel body, the handle shaft having a front end to which a handle is mounted, the improvement comprising:

a bracket secured to and protruded from said front end of said handle shaft and extending substantially in the radial direction of said handle shaft, said bracket having an axially parallel sectional configuration comprising an axially directed part directed axially of said handle shaft, an inwardly inclined following part directed radially inwardly relative to said handle shaft, and a flat part extending radially relative to said handle shaft;

a handle arm having a base end portion, said base end portion being swingably pivoted to said bracket, said base end portion of said handle arm comprising an inverted U-shaped member provided with a lower guide wall at an intermediate portion thereof, said base end portion having an arc shaped upper inner surface which engages a peripheral portion of said bracket for rotation thereof around said peripheral portion of said bracket, and said lower guide wall having a front end having a cut therein transversely of said handle arm to contact and meet with said axially directed part of said bracket;

a locking element coupled to said handle arm and having an engagement portion, said locking element being selectively movable longitudinally of said handle arm between (i) a locking state in which said engagement portion engages said inclined following part and said radially extending flat part of said bracket and (ii) a retracted state in which said engagement portion is out of engagement with said inclined following part and said radially extending flat part of said bracket; and

resilient means coupled between said handle arm and said locking element for urging said locking element toward its said locking state.

4,524,922

FISHING REEL WITH OSCILLATING MOVEMENT ACTUATING LEVER

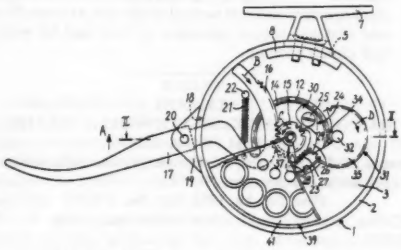
Franco Vivarelli, Via Beniamino Gigli 7, Bologna, Italy

Filed Feb. 3, 1983, Ser. No. 463,362

Claims priority, application Italy, Feb. 15, 1982, 3337 A/82

Int. Cl.[3] **A01K** *89/00*

U.S. Cl. 242—84.1 R **1 Claim**



1. A fishing reel comprising a case provided with means for attachment to a fishing rod, a shaft rigidly secured in said case, a gear wheel and a line storage spool rotatably carried on said shaft, a torque limiter for rotatably connecting said gear wheel with said spool, a manually operable lever pivoted for oscillation in said case, a gear segment associated with said lever and gear means connecting said gear segment with said gear wheel for driving the spool in line winding direction when the lever is actuated, said gear means including a one-way coupling acting in line winding direction, wherein according to the improvement said gear means comprise a second gear wheel rotatably supported on said shaft and having a central bushing extending on said shaft, a pinion rotatably supported on said bushing and meshing with said gear segment, a flange peripherally formed on said second gear wheel and surrounding said pinion so as to define a space herewith, a pawl pivoted on said second gear wheel inside said space and having a tooth facing said pinion and a shoe portion, and a spring acting on said pawl to hold said shoe portion in abutment on said peripheral flange and the tooth in engagement between the teeth of the pinion when the spool is driven in line winding direction.

4,524,923

FISHING SPINNING REELS

Kikuo Tunoda, Hiroshima, and Kiyomi Ozaki, Fuchu, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan

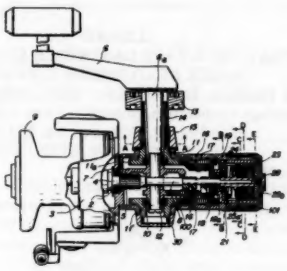
Filed May 5, 1982, Ser. No. 375,206

Claims priority, application Japan, May 25, 1981, 56-76321[U]; May 25, 1981, 56-76322[U]

Int. Cl.[3] **A01K** *89/01, 89/02*

U.S. Cl. 242—84.5 A **5 Claims**

1. A fishing spinning reel comprising:
a hollow main body having front and rear ends;
a main shaft within the main body having a spool attached to its front end;
a handle shaft rotatably mounted on the main body;
a handle connected to the outer end of the handle shaft;
a gear mechanism within the main body drivingly connecting the handle shaft and the main shaft;
a drag knob telescoped over the handle shaft and disposed adjacent to the handle;
a rotatable hollow shaft telescoped over the handle shaft and having the drag knob affixed to the outer end thereof; and
a drag force generating mechanism connected between the rear end of the main body and the rear end of the main shaft and operated upon the rotation of said drag knob and hollow shaft, said drag force generating mechanism comprising:
a drag bush mounted on the rear end of the main shaft;
an inner housing installed in the rear end of the main body;
a plurality of drag washers arranged between said inner housing and said drag bush, some of which having a circular opening at the center thereof which receives said drag bush and a pair of radial projections at the outer peripheral thereof which slidably engage a pair of grooves of the inner housing while the other drag washers have a rectangular opening at the center thereof which engages the drag bush having a rectangular cross section;
a plurality of friction discs inserted between said drag washers; and
a drag spring forcing said washers and friction discs to the axial direction.



4,524,924

SEAT BELT REEL

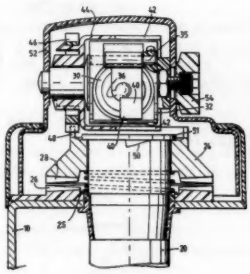
Ronald A. Proctor, "Sedbury", Woodham La., Woking, Surrey, England

Filed Dec. 10, 1982, Ser. No. 448,499

Claims priority, application United Kingdom, Dec. 23, 1981, 8138818; Feb. 26, 1982, 8205662

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. A seat belt reel comprising:
(a) a casing adapted to be mounted in transportation means;
(b) a reel shaft rotatably carried on said casing with a strap of said belt being wound on said reel shaft;
(c) locking means operatively associated with said reel shaft to lock said reel shaft against rotation, said locking means including a rotatable member;
(d) coupling means coupling said rotatable member of said locking means with rotatable carrier means mounted for rotation with said rotatable member;

(e) an inertia member adapted to move when said transportation means is subjected to an irregular movement, said inertia member being carried in said rotatable carrier means; and

(f) an element associated with said inertia member and responsive to movement thereof to prevent rotation of said rotatable carrier means whereby said rotatable member of said locking means is also prevented from rotating and thus locks the reel shaft against rotation.

4,524,925

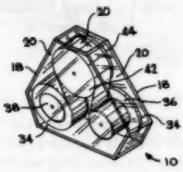
OPTICAL DATA TAPE CARTRIDGE HAVING WIDE ANGLE READ/WRITE SURFACE

Richard Haddock, Redwood City, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Feb. 17, 1984, Ser. No. 581,323

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—197 **10 Claims**



6. A cartridge for optical recording and storage tape comprising,

a housing having a top wall, a bottom wall and side walls,

tape supply and take-up spools and a capstan with a tape path extending from the supply spool to around the periphery of the capstan to the take-up spool, and

at least one transparent window defined in each said side wall having regions parallel to tangent planes of the capstan in three locations, the furthest points of tangency forming an angle exceeding 90° when subtended to the center of said capstan.

4,524,926

CASSETTE AND CASSETTE ADAPTER FOR USE THEREWITH

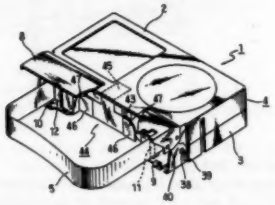
Tsuneo Nemoto, and Kokichi Sugawara, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,412

Claims priority, application Japan, Apr. 16, 1982, 57-55239[U]

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **2 Claims**



1. A tape cassette for use with an information signal recording and/or reproducing apparatus having reel driving means, said tape cassette comprsing:

housing means;

a supply reel rotatably positioned within said housing means;

a take-up reel rotatably positioned about a fixed axis of rotation within said housing means;

engaging means mounted within said housing means for rotation with said take-up reel and engageable by said reel driving means for rotatably driving said take-up reel;

lid means pivotally mounted to said housing means; and

lid lock means for preventing pivotal movement of said lid means to an open position;

said lid means including a first aperture, said housing means including a second aperture in alignment with said first aperture when said lid means is in a closed position and a third aperture, and said lid lock means including an arm pivotally mounted within said housing means, a first projection, a second projection and spring means for biasing said arm so that said first projection extends through said third aperture and said second projection extends through said first and second apertures to lock said lid means in said closed position.

4,524,927

MAGNETIC-TAPE CASSETTE WITH A FLEXIBLE LATCH FOR A COVER

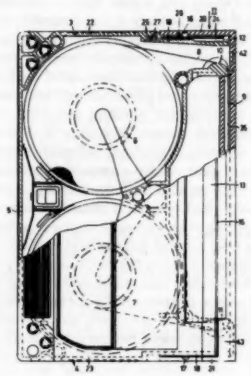
Joannes H. F. C. Sieben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 513,942

Claims priority, application Netherlands, Aug. 17, 1982, 8203219

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **14 Claims**



1. A magnetic-tape cassette comprising:

a housing having major walls, first and second substantially parallel side walls, and a front with a front aperture or recess between the major walls,

a magnetic tape which has a portion which extends across said front aperture or recess in the housing to cooperate with parts of a magnetic-tape cassette apparatus;

a cover pivot which is perpendicular to the side walls of the housing,

at least one front cover which is pivotable about said cover pivot from an open position to a closed position which front cover at least partly covers the front aperture or recess in the housing in the closed position;

a lever pivot which is connected to the housing,

a least one latching lever which is pivotable about said lever pivot, situated near one of the side walls, from an inoperative position to a latching position in which the latching lever latches the front cover in the closed position; and

spring means for biasing said lever from the inoperative position toward the latching position,

characterized in that the latching lever comprises two arms of different lengths arranged in the form of an L, the

longer arm being elastically deflectible over at least part of its length and comprising a latching portion at an end which is remote from the shorter arm; and the shorter of said arms is connected to the pivot for the latching lever at an end which is remote from the longer arm,

the pivot of the latching lever extends substantially parallel to the pivot of the front cover and is connected to said one of the side walls of the housing, and

the cassette further comprises guide means disposed near the latching portion for guiding said portion during the pivotable movement of the latching lever.

4,524,928

WING-SECTIONS, IN PARTICULAR AIRCRAFT LIFT-WING SECTIONS

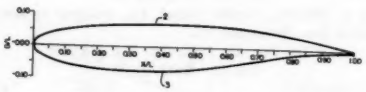
Wolfgang Schmidt, Friedrichshafen, and Jose M. Longo, Deggenhausertal-Untersiggingen, both of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

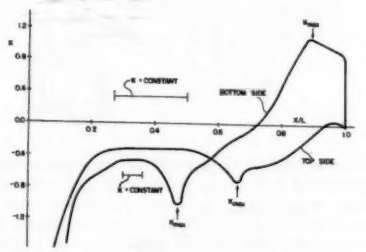
Filed Sep. 14, 1982, Ser. No. 418,064

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140351

Int. Cl.³ B64C *3/14*

U.S. Cl. 244—35 R **9 Claims**





1. Wing sections, in particular lift-wing sections for aircraft with a design Mach number between 0.2 and 0.9 and with a lift range between −0.2 and 0.6 in the high velocity range and up to 1.5 in the low velocity range, in which

(a) the wing section evinces respectively areas of constant curvature on its top side between 30% and 50% of the relative wing section depth (x/1) and on its bottom side between 20% and 40% of the relative wing section depth (x/1), said areas of constant curvature terminating on each side in a maximum of curvature to stabilize a location of production of shocks and wherein the maximum of curvature at the top side is provided at 60 to 70% of the relative wing section depth, with $|k| > 0.6$ and wherein the maximum of curvature at the bottom side occurs at 35 to 50% of the relative wing section depth; and

(b) the areas of maximum curvature are joined and continued by recompression areas, with at least two inflection points in the respective contour curvature on top and bottom sides, and extending respectively to the trailing edge.

4,524,929

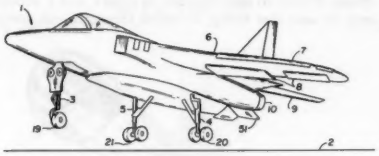
SHORT TAKE OFF JUMP MODE FOR AIRPLANE LANDING GEAR STRUTS

David F. Gebhard, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,657

Int. Cl.³ B64C *25/26, 25/60*

U.S. Cl. 244—63 **21 Claims**



1. A method of facilitating early takeoff of an airplane or, alternatively, increasing the payload of the airplane without increasing takeoff ground roll, said airplane having a telescoping, energy-dissipating oleo shock strut affixed to an extendible from the nose of said airplane, said method comprising the steps of

restraining said shock strut in unenergized shortened condition;

energizing said strut;

accelerating said airplane from standstill;

releasing said strut during the takeoff run acceleration of said airplane, whereby the energy of said strut extends said strut from said airplane and is dissipated thereby increasing the angle of attack of said airplane, causing an upward increase in lift which decreases gravity effect during acceleration of said airplane and shortens its takeoff roll; and

immediately restoring the landing shock energy dissipation condition of said strut thereby immediately reinstituting the normal landing function of said strut.

7. A jump strut device for facilitating early takeoff of an airplane or, alternatively, increasing the payload of the airplane without increasing takeoff ground roll, said airplane having a telescoping, energy-dissipating oleo shock strut affixed to and extendible from the nose area of said airplane, said device comprising

latching means for latching said shock strut in its shortened condition;

pressure means for pressurizing the interior of said shock strut while it is latched;

release means for unlatching said latching means during takeoff run acceleration of said airplane, whereby the internal pressure of said strut extends said strut from said airplane and is dissipated, thereby pushing said airplane upward and increasing the angle of attack of said airplane, causing an increase in lift and a decrease in gravity effect during acceleration of said airplane and shortening its takeoff roll; and

restoring means for immediately restoring the landing shock energy dissipation condition of said strut thereby immediately reinstituting the normal landing function of said strut.

4,524,930

INFLATION-CONTROLLED PARACHUTE

Matts J. Lindgren, and Murl F. Culp, both of Cupertino, Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jun. 17, 1983, Ser. No. 505,301

Int. Cl.³ B64D *17/36*

U.S. Cl. 244—152 **6 Claims**

1. A parachute comprising:

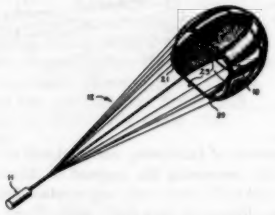
(a) a flexible structure that is foldable into a stowed configuration, said flexible structure being unfoldable from said

stowed configuration into an inflated configuration so as to provide an aerodynamic drag-producing surface, and

(b) inflation control means for enabling said flexible structure to unfold from said stowed configuration into said inflated configuration at a controlled rate, said inflation control means including:

(i) a plurality of positioning rings attached to said flexible structure, and

(ii) a flexible inflation-control line, a first portion of said line being affixed to said flexible structure and a second portion of said line being threaded through said positioning



rings, said second portion of said line moving relative to said first portion of said line when said flexible structure unfolds into said inflated configuration, one segment of said second portion of said line overlying another segment of said second portion of said line within at least one of said positioning rings, said one segment being in frictional engagement with said other segment when said second portion of said line moves relative to said first portion of said line, said frictional engagement of said segments of said second portion of said line providing frictional resistance for controlling the rate at which said flexible structure unfolds into said inflated configuration.

4,524,931

DEVICE FOR INDICATING A CERTAIN PROXIMITY BETWEEN MOVABLE UNITS

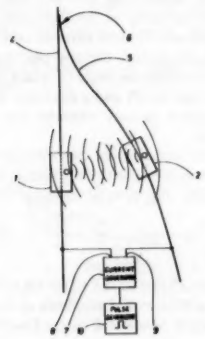
Arne H. A. Nilsson, Kungsbacka, Sweden, assignor to Ingeniorsfirma N D.C. Netzler & Dahlgren Co Aktiebolag, Saro, Sweden

Filed Nov. 9, 1981, Ser. No. 319,635

Claims priority, application Sweden, Nov. 12, 1980, 8007933

Int. Cl.³ B61L *3/00, 1/08;* **G01S** *3/02*

U.S. Cl. 246—167 D **3 Claims**



1. An apparatus for indicating a certain proximity between movable vehicles having a control device assuring that the vehicles automatically follow a predetermined path determined by electrical control loops fed with an alternating current, said apparatus comprising a device for transmitting by means of said electrical control loops to said vehicles an electro-magnetic synchronizing signal in the form of synchronizing pulses propagated with very high speed, a first receiver device, and a transmitter device, situated on each of said vehicles for receiving the synchronizing pulses and for activating said transmitter devices to emit an information signal in the form of wave propagation movement in the air with a considerably lower speed of propagation in comparison with the synchronizing signal, said information signal being in the form of information pulses emitted in synchronism with the reception of the synchronizing pulses, devices situated on each of said vehicles, including a second receiver for receiving the information pulses, means for measuring a time difference arising between the synchronizing pulses as received by a vehicle and the received information pulses emitted synchronously from another vehicle, means for comparing said time difference with a predetermined time value corresponding to a certain proximity between the vehicles, and means for emitting a proximity indicating signal, when said time difference falls below said time value, thereby indicating that the distance between two vehicles lies below a predetermined distance value, said synchronizing pulses reaching all vehicles substantially simultaneously, resulting in that all vehicles transmit during their travel along the path information signals substantially in synchronism with each other and that said proximity indicating signal is caused to be emitted in each individual vehicle, as soon as the same comes within said certain proximity of any other vehicle.

4,524,932

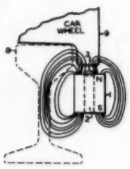
RAILROAD CAR WHEEL DETECTOR USING HALL EFFECT ELEMENT

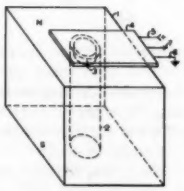
Thomas A. Bodziak, Neville Island, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Dec. 30, 1982, Ser. No. 454,519

Int. Cl.³ B61L *1/16*

U.S. Cl. 246—247 **7 Claims**





1. Wheel detector apparatus for car wheels moving along a railroad track rail, comprising:

(a) a permanent magnet means with an internal hole extending parallel to the pole-to-pole axis for creating a magnetic flux null space along that axis within said hole and externally at both poles,

(b) said magnet means positioned adjacent the gauge side of said rail a predetermined distance below the top of said rail with said pole-to-pole axis in vertical alignment with the flange of each passing car wheel, for generating a first and a second level of magnetic flux when a car wheel is absent and present, respectively,

(c) a Hall effect means positioned at the upper end of said magnet means within said null space and with its critical axis parallel to said pole-to-pole axis,

(d) said Hall effect means responsive to flux from said magnet means for generating an output voltage proportional to the existing flux level, and

(e) a detector network coupled for responding only to said Hall effect means output voltage representing said second flux level to register the passage of a car wheel.

4,524,933

APPARATUS AND MOUNTING SHELL HAVING RETAINING TONGUES FORMED BY CUTS

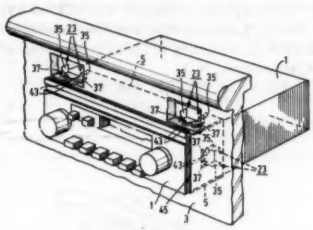
Petrus L. A. Rouws, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 399,043, Jul. 16, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,667

Claims priority, application Netherlands, Jul. 29, 1981, 8103575

Int. Cl.³ G12B 9/00

U.S. Cl. 248—27.3 **16 Claims**



1. An arrangement for securing an element inserted into a hole in a mounting wall, said mounting wall having outer and inner surfaces spaced a given wall thickness apart, and

said element having at least one element wall arranged to extend perpendicularly through said mounting wall adjoining an edge of the hole in the mounting wall; an abutment portion arranged to bear against a portion of said outer surface; and at least one tongue formed by a cut in said element wall arranged to leave a bridge portion between the tongue and the element wall, and bent outward from said element wall and arranged to engage said inner wall and press against said inner wall with force resulting from bending of a portion of the tongue,

characterized in that said tongue comprises a mounting portion and a supporting portion which are bent outward together from said element wall about a first axis perpendicular to said mounting wall and extending along said bridge portion; and said mounting portion has a free end which engages and bears against said inner surface, and is arranged such that said mounting portion is bent relative to the supporting portion about a second axis parallel to said supporting portion and lying in a plane parallel to said mounting wall,

whereby said free end bears against said inner surface with a force determined mainly by the degree of deformation of the mounting portion.

4,524,934

PIPE HANGER

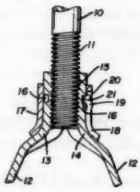
Ray M. Rumble, Canfield, Ohio, assignor to Michigan Hanger Company, Inc., Hubbard, Ohio

Continuation of Ser. No. 381,077, May 24, 1982, , which is a continuation-in-part of Ser. No. 257,599, Apr. 27, 1981, abandoned. This application Dec. 1, 1983, Ser. No. 556,777

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.³ F16L 3/00

U.S. Cl. 248—62 **7 Claims**



1. An improvement in a pipe hanger which pipe hanger includes a strap which may be bent and positioned about a pipe to be suspended, the ends of said strap arranged to be moved to positions adjacent one another and secured to a threaded support rod, the improvement comprising means for securing said ends of said strap to said threaded support rod, said means consisting of end portions on said strap shaped to engage the opposite sides of said threaded support rod, and a ferrule movable coaxially of said support rod over said end portions of said strap so as to move said end portions against said threaded support rod in non-slipping engagement therewith, and means for locking said ferrule in said position against said end portions, said locking means consisting of inter-engaging snap-in resilient configurations formed in said ferrule and in at least one of said end portions of said strap, said ferrule and locking means being integrally formed of resilient metal.

4,524,935

PIPE HANGER

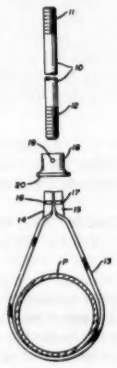
Ray M. Rumble, Canfield, Ohio, assignor to Michigan Hanger Company, Inc., Hubbard, Ohio

Continuation of Ser. No. 381,077, May 24, 1982, which is a continuation-in-part of Ser. No. 257,599, Apr. 27, 1981, abandoned

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.³ F16L 3/00

U.S. Cl. 248—62 **11 Claims**



1. An improvement in a pipe hanger, which pipe hanger

includes a strap to be positioned about a pipe to be suspended, the ends of said strap arranged to be moved to positions adjacent one another and secured to a threaded support rod, the improvement comprising means for securing said ends of said strp to said threaded support rod, said means consisting of cross sectionally arcuate end portions on said strap engaging the opposite sides of said threaded support rod, and a ferrule movably coaxially of said support rod over said end portions of said strap so as to move said end portions against said threaded support rod in non-slipping engagement therewith, and means for locking said ferrule in said position against said end portions, said locking means consisting of inter-engaging snap-in resilient configurations formed in said ferrule and in at least one of said end portions of said strap, said ferrule being resilient and distortable.

4,524,936

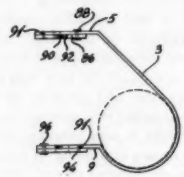
PIPE HANGER

Gerard Hurtubise, 851 Rochon, Ste-Thérèse-en-haut, Quebec, Canada G7E 4B2

Continuation of Ser. No. 472,770, Mar. 7, 1983, which is a continuation-in-part of Ser. No. 291,953, Aug. 11, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,441

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—62 **6 Claims**



1. A pipe hanger having a threaded support rod; a unitary, preformed bracket, the bracket consisting of a top section, a bottom section, and a pipe receiving section joining the top and bottom sections, the top section overlying the bottom section and extending parallel to it, the pipe receiving section lying to one side of the top and bottom sections and below the bottom section, the bottom section being straight and merging with the pipe receiving section, a support rod extending in a vertical axis at a right angle to the top and bottom sections, a mounting opening in the form of a slot in both the top and bottom sections, the slots in both sections aligned on the axis of the rod which extends perpendicular to both sections, the slots extending inwardly from side edges of the respective sections, a jaw pivotally mounted on each section and movable between a slot open position wherein the rod is free to be placed within the slots and a slot closed position wherein the jaw is closed against the rod to secure the bracket on the rod, and wherein the pipe pipe receiving and the bottom section retains a pipe against movement in a direction transverse to the pipe axis.

4,524,937

BUCKLE CONNECTION FOR HANGING CABLE

John P. Zizan, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Jan. 20, 1983, Ser. No. 459,310

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74.3 **12 Claims**

1. Cable support structure comprising,

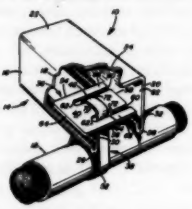
a structural support including a longitudinally extending channel-shaped support member,

said support member including a pair of spaced side walls having free end portions turned inwardly to form opposed, longitudinally extending flanges,

locking strip means extending around a cable for securing the cable to said support member, said locking strip means including a first end portion and a second end portion,

a rigid member positioned within said support member and supported by said flanges,

said rigid member having a body portion extending between said flanges, said body portion including slotted means for receiving said locking strip means to extend around said



rigid member in overlying relation with said rigid member body portion, and

means associated with said locking strip means for connecting said first end portion to said second end portion to form a loop of a preselected size extending around said rigid member at a first end portion and around the cable at a second end portion to support the cable from said support member.

4,524,938

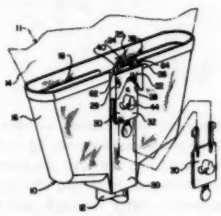
SELF CONTAINED BROOM HANGING SYSTEM

Martin P. Strahs, Lawrenceville, and John Vosbikian, Mt. Laurel, both of N.J., assignors to Quickie Manufacturing Corporation, Cinnaminson, N.J.

Filed Jan. 17, 1983, Ser. No. 458,307

Int. Cl.³ A46B *17/02*

U.S. Cl. 248—110 **18 Claims**



1. A combination broom and broom hanging system of the type including a broom having a handle and sweeping portion affixed at one end of the handle comprising

a shroud secured about the sweeping portion and adapted to move when the broom is moved, the shroud comprising a sidewall and a hanger holder integral with and extending from the shroud; and

a hanger removably engaged with the hanger holder, the hanger comprising a body, leg means of

predetermined thickness extending from the body to releasably engage the hanger holder, means to secure to a fixed surface and hook means formed in the body to hang the broom, the hanger being movable from a first, storage position in association with the hanger holder and a second, hanging position that is on the fixed surface;

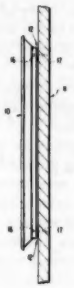
whereby the broom may be supported upon the fixed surface by affixing the hanger to the surface by utilizing the means to secure and then engaging the hook means portion of the hanger with a portion of the hanger holder.

4,524,939

DOUBLE PRONGED FASTENER WITH PARTIALLY DELAMINATED ADHESIVE LAYER

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation, Goodlettsville, Tenn.

Continuation-in-part of Ser. No. 97,145, Nov. 26, 1979, Pat. No. 4,317,555. This application Feb. 25, 1982, Ser. No. 352,188
Int. Cl.³ A47F *7/14*
U.S. Cl. 248—467 **16 Claims**



1. Fastener for mounting an object having a wood member on a wall comprising plaster, or gypsum, wallboard or the like, comprising:

a flat sheet of metal;

a sheet of liquid degradable, partially delaminated fibrous material bonded to one side of said metal sheet to form a composite of sheet metal and fibrous material

the exposed surface of said fibrous sheet being coated with a soluble adhesive;

a pair of flat metal prongs projecting outwardly from respective opposite sides of said composite of sheet metal and fibrous sheet material and at right angles thereto;

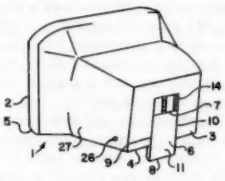
the free ends of said prongs being sharply pointed to facilitate insertion respectively into wood material and into a wall.

4,524,940

MONITOR FOOT

James R. Yurchenco, and Michael J. Nuttall, both of Palo Alto, Calif., assignors to MAD Computer, Inc., San Jose, Calif.

Filed Nov. 28, 1983, Ser. No. 555,993
Int. Cl.³ A47B *91/00*
U.S. Cl. 248—359 **3 Claims**



1. An apparatus for adjusting the angle of presentation of a screen on the front of a video monitor, the video monitor having a lower edge, comprising:

a slidable foot, having a top, a bottom, a left side, a right side, an inside, and an outside for supporting the video monitor at an angle of presentation;

rail means for securing said slidable foot formed along said left side and said right side of said slidable foot;

guide means formed on the video monitor for receiving said rail means so that said slidable foot slides to extend said bottom of said slidable foot below the lower edge of the video monitor;

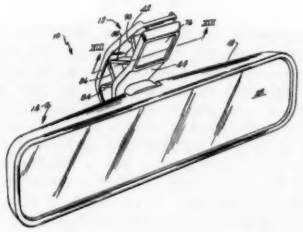
ratchet means for engaging said slidable foot to prevent movement of said slidable foot when engaged, said ratchet means including a series of teeth formed on said slidable foot on said inside parallel with said left side, and an elongate member with a pawl for engaging one of said series of teeth mounted on the video monitor, said elongate member being mounted so that a distal end of said elongate member protrudes slightly from said video monitor and a proximal end is adjacent said series of teeth, and a ratchet spring mounted on the video monitor against said proximal end of said elongate member so that said pawl tends to engage said series of teeth and so that said pawl is disengaged by depressing said distal end.

4,524,941

REARVIEW MIRROR SUPPORT BRACKET

Denis Wood, Dublin, Ireland; John F. Thomas, Jr., Holland, Mich.; Barry Dipper, Cardiff, Wales; Philip D. Stegenga; John H. Veltkamp, both of West Olive, Mich.; William L. Katsma, Jenison, and Robert L. Norton, Holland, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Jun. 24, 1981, Ser. No. 276,839
Int. Cl.³ B60R *1/02*
U.S. Cl. 248—544 **2 Claims**



1. A breakaway rearview mirror bracket for attaching a rearview mirror to a mounting button, said bracket comprising:

a body having a top end and a bottom end, said body further including mirror case mounting means at its bottom end for adjustably mounting a mirror case to said body; and

an attachment means joined to said body adjacent said top end, said attachment means comprising:

a generally planar member;

a pair of opposed, elongated clips which define opposed, inwardly opening grooves dimensioned to receive the mounting button in a tongue and groove fashion, said clips being formed of a resilient material, each of said clips being generally L-shaped in cross section including a sidewall and an inwardly directed lip having an under surface which is sloped downwardly towards said sidewall;

pivot and tension means mounted in a substantially fixed position on and extending from said planar member for engaging the mounting button, said pivot and tension means dimensioned to tension the clips after receipt of the button to securely locate the bracket on the button and to act as a substantially fixed pivot to cause the bracket to break away from the button when the bracket sustains a predetermined impact;

a surrounding wall which encloses and extends around three sides of said planar member, said wall defining an open end for receipt of the button;

resilient retaining means adjacent said clips for engaging and retaining said body on the button after said clips have received the button; and

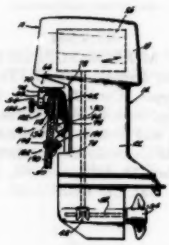
a pair of transversely spaced, longitudinally extending guides, each having a generally V-shaped in cross section, said guides extending upwardly from said planar member, one of said guides being adjacent each of said clips to prevent a leading edge of the button from catching on the attachment means as the clips are slid over the button.

4,524,942

OUTBOARD MOTOR MOUNTING ASSEMBLY

Don F. Kueny, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 27, 1983, Ser. No. 545,823
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—643 **6 Claims**



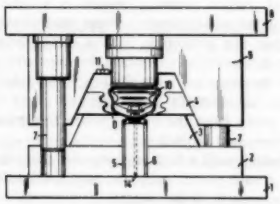
1. An assembly for mounting an outboard motor on the transom of a boat, said assembly comprising an inverted U-shaped clamp member adapted to have the motor mounted thereon, said clamp member including an upper body portion, an inside leg extending downwardly and rigidly from said upper body portion and in position to be located inside of the transom, an outside leg extending downwardly and rigidly from said upper body portion and in position to be located outside of the transom and including a bottom end, a transom plate adapted to be fixed on the inside of the transom, and means adapted to extend through the transom for securing said outside leg to said transom plate, means for clamping said clamp member to the transom including selectively engageable interengaging means on said clamping means and said transom plate for fixing said clamping means to said transom plate, and means for preventing movement of said bottom end relative to the transom.

4,524,943

INJECTION MOLD

Peter Busch, Bochum, and Karl-Heinz Barbet, Korschenbroich, both of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,734
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228748
Int. Cl.³ B29C *11/00*
U.S. Cl. 249—63 **10 Claims**



1. In an injection mold for the manufacture of a sealing element of elastic material which has outer and inner undercuts, having followers which are divided centrally in a longitudinal direction of the sealing element and correspondingly form an outer contour of the sealing element, the mold including a core plunger which correspondingly forms an inner contour of the sealing element and is divided into an upper core plunger part and a lower core plunger part which are movable longitudinally relative to each other and from which the sealing element is removed after the opening of the followers, the improvement in combination wherein

said followers are divided further in a transverse direction in the region between the inner of the undercuts of smallest diameter and the outer of the undercuts of smallest diameter into an upper pair of said followers and a lower pair of said followers,

each of said upper and lower pairs of followers are movable transversely to the longitudinal direction independently of each other, and wherein

said mold further comprises an ejection sleeve, the lower core plunger part being guided in said ejection sleeve, said sleeve being movable relative to the lower core plunger part and with an end surface thereof forming a part of the outer contour of an end surface of the sealing element, and

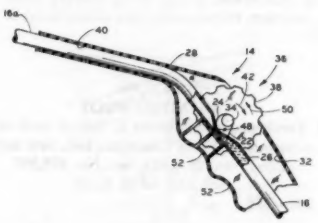
means for simultaneously feeding compressed air for expanding the sealing element when said one of said pairs of followers open for initiation of automatic removal of the sealing element from one of the core plunger parts adjacent said one of said pairs of followers when the other of said pairs of followers is closed and holding the sealing element firmly sealed on the other core plunger part.

4,524,944

PLANT-WATERING DEVICE

Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060

Filed Dec. 27, 1982, Ser. No. 453,612
Int. Cl.³ B05B *1/30*; F16K *7/06*
U.S. Cl. 251—6 **1 Claim**



1. An improved indoor plant-watering device comprising a housing, a cam-like rotatable operative member having a peripheral contact surface thereon at variable distances from a rotation axis such that a leading end of said surface is at a selected minimal distance and a trailing end thereof is at a selected maximum distance and said surface is of a smooth configuration therebetween, said cam-like member having a pair of hubs extending laterally from opposite sides thereof journalled for rotation in opposite sides of said housing for establishing said rotation axis thereof, a large diameter knob located adjacent said cam-like member on said hubs having a knurled peripheral edge providing finger grips and also visual indices of positions of rotation of said cam-like member, a tube of squeezable construction material disposed in said housing for flowing water from a source to a point of discharge from said plant-watering device, and means for mounting said cam-like member for rotation on said housing such that the rotative path of said peripheral surface thereon is effective to establish squeezing contact of said surface against said tube for providing a fully open flow condition in said tube operatively associated with said leading end of said cam-like surface and a fully

closed condition therein operatively associated with said trailing end thereof and all flow conditions therebetween such that there is adjustability in the volume of the water discharging from said device afforded by said cam-like member which also obviates any possible damage to said tube by reason of the established contact therewith by said cam smooth peripheral surface, and a cooperating pair of sides in said housing shaped as a handle, whereby the user is able to grip the device and to rotate said knob with the user's thumb on said gripping hand.

4,524,945

PRESSURE-FLUID OPERATED LIMIT SWITCH

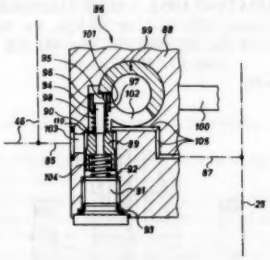
Norbert Mucheyer, Rechtenbach, and Heinz Schulte, Marktheidenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,627

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148500

Int. Cl.³ F16K *31/52*

U.S. Cl. 251—75 **7 Claims**



1. A limit switch for a pressure fluid-operated device including a pressure fluid source, an adjusting element, and a pressure compensator, the limit switch comprising a valve housing provided with a recess and formed with a valve seat; a valve member located in said recess and abutting said valve seat when the switch is in its closed position, said valve member having one side facing toward said seat and another side facing away from said seat; a valve spring arrange at said another side and biasing said valve member toward said seat, said valve member being adapted at times to move away from said valve seat against the action of said valve spring; and actuating member having an axis and rigidly connected to said valve member, said actuating member having a portion extended outwardly therefrom beyond said valve seat in said housing; a sleeve mounted on said portion and adapted to axially slide thereon; and a prestressed spring arranged on said actuating member at a side thereof facing away from said valve spring, said prestressed spring being clamped between said sleeve and said valve member, said portion including a stop flange extended radially outwardly therefrom and being integral therewith, said sleeve being formed with a stop projection extending inwardly toward said portion and cooperating immediately with said stop flange, said sleeve projecting beyond said actuating member in the direction of said axis when the switch is in its closed position.

4,524,946

BALL VALVE HAVING IMPROVED SEAL MEANS

William E. Thompson, R.R. 1, Box 89, Middletown, Ind. 47356

Continuation-in-part of Ser. No. 317,579, Nov. 2, 1981, Pat. No. 4,428,561. This application Jan. 10, 1983, Ser. No. 456,774

Int. Cl.³ F16K *35/00*

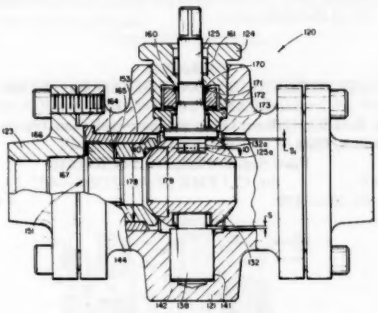
U.S. Cl. 251—88 **11 Claims**

1. A ball valve operable between a fully-open position and a closed position for regulating fluid flow, said ball valve comprising:

a valve body having a flow passageway extending therethrough;

a ball plug member disposed within said flow passageway and having a flow hole therethrough, said flow hole terminating in open ends adjacent the exterior surface of said ball plug;

a pair of oppositely positioned ball seats, each seat being cooperatively disposed in sealing contact against the outer surface of said ball plug with a corresponding circular line of contact, each of said circular lines of contact encompassing the open ends of said flow hole; and



a pair of spring seal assemblies disposed within said valve body and positioned around said flow passageway, one spring seal assembly on each side of said ball plug, each of said spring seal assemblies including seal-energizing means and an L-ring annular seal member which is oriented to have two outwardly facing sealing surfaces and an interior annular corner, said annular seal member being disposed continguous to its corresponding ball seat and said seal-energizing means acting upon its corresponding annular seal member, said spring seal assemblies being free of any elastomeric materials thereby enabling said spring seal assemblies to be used with high-temperature fluids.

4,524,947

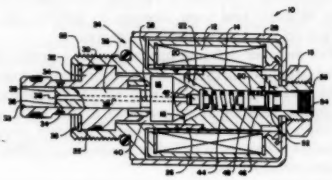
PROPORTIONAL SOLENOID VALVE

Pierre D. Barnes, and Maynard W. Marts, both of Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Nov. 30, 1982, Ser. No. 445,773

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—129 **8 Claims**



1. A normally closed two way proportional solenoid-operated valve assembly including:

a body having a bore therein;

a lateral passage in the bore;

a spool slidably positioned in the bore overlapping the lateral passage in the closed position and forming a variable opening with the lateral passage in various open positions;

an armature means attached to said spool for positioning the spool and controlling the valve opening;

a pole piece means in the body positioned adjacent the armature forming an air gap therebetween;

a first spring means having a predetermined spring rate urging the armature and spool toward the overlapping closed position;

a second spring means having a lesser spring rate than the first spring means positioned in series with the first spring means urging the armature and spool toward the overlapping closed position;

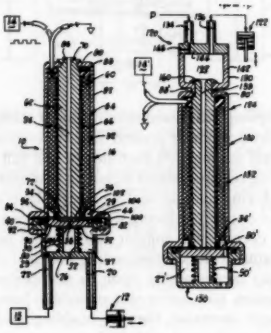
coil means operable to produce a circuit of electromagnetic flux line flow and provide a variable attractive force between the armature and pole piece to overcome the second spring means and the first spring means in sequence with intermediate positions of the armature and spool therebetween.

4,524,948

ELECTRICALLY CONTROLLED PRESSURE TRANSDUCER VALVE

Dale G. Hall, Galena, Ohio, assignor to Ranco Incorporated, Dublin, Ohio

Filed Sep. 9, 1983, Ser. No. 530,510
Int. Cl.³ F16K *31/02, 17/04*
U.S. Cl. 251—139 **9 Claims**



1. An electrically controlled pressure transducer valve comprising:

(a) a controlled output pressure passage;

(b) an input passage communicating with a source of pressure and with said output passage, said input passage defining a flow restriction of substantially restricting flow therethrough so that changes in source pressure are not abruptly communicated to said output passage;

(c) a vent passage communicable with said pressure passage between said flow restriction and said output passage;

(d) valve means for controllably varying the degree of communication through said vent passage to govern the output pressure level, said valve means comprising:

(i) a valve member defining opposed sides forming first and second effective pressure areas respectively exposed to output and vent pressures, said effective pressure areas consituting substantial proportions of the total areas of said valve member sides, said valve member movable in response to changes in differential pressure applied to said effective pressure areas;

(ii) an electromagnetic actuator for exerting magnetic force on said valve member, said actuator comprising a coil connected to an electrical power source for producing an electromagnetic field, a core extending within said coil and a pole piece having one end section connected to said core, a thin walled tubular sleeve section closely surrounding said coil and a second end section having a peripheral portion extending circumferentially about said core and disposed adjacent said valve member for establishing a substantially uniform concentrated magnetic flux path extending peripherally about said core across a gap between said second pole piece end section and said one valve member side to minimize application electromagnetic tipping forces on said valve member; and,

(iii) a nonmagnetic valve seat coacting with said one valve member side for blocking communication between said vent passage and said output passage, said valve seat positioned to prevent said valve member from engaging said core and pole piece and configured to maintain said valve member uniformly spaced from said core and pole piece when communication between said vent and output passages in blocked, said valve seat defining, with said one valve member side, one of said first and second effective pressure areas; and,

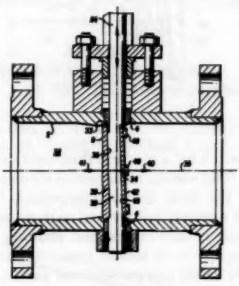
(e) biasing means for biasing said valve member toward engagement with said valve seat, said valve member acted upon by differential pressure force, electromagnetic force and biasing force to govern the flow through said vent passage and control the pressure of said output port.

4,524,949

HIGH PRESSURE BUTTERFLY VALVE WITH FLOATING DISK VALVE MEMBER

John R. Goetzinger, 2956 W. 17th St., Erie, Pa. 16506

Filed Jan. 31, 1983, Ser. No. 462,208
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—163 **2 Claims**



1. A valve comprising

a unitary body having an axial flow passageway therethrough defined in part by a radial metal valve seat,

a unitary metal valve disk member having a forward face with a metal radially sealing surface which sealably engages said metal radial seat when the disk is in closed position, the valve disk member further having a rearward face opposite said forward face, said sealing surface being spherical about a point on the axis of flow through said passageway to the rear of said forward face,

a diametral slot in the rearward face of the valve disk member, said slot being of rectangular cross section with its bottom wall inclined to the axis of the valve stem at a wedging angle,

a unitary valve stem journaled in said body for rotation about and axial displacement along its axis, the stem axis extending transverse to the axis of flow through said passageway,

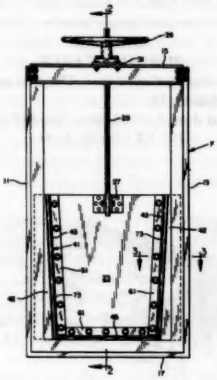
a cam integral with the stem cooperating with a surface at the bottom of said slot to wedge the disk toward said seat upon said axial displacement of the stem, said cam being a section of the valve stem of rectangular cross section complementary to the slot and wedging the valve closed upon axial displacement of the stem,

and a retainer fixed to the valve disk member extending over the stem remote from said bottom surface and holding the stem in said slot.

4,524,950
OPEN CHANNEL GATE VALVE

John K. Vitas, Wilsonville, and Harry J. Reed, Gladstone, both of Oreg., assignors to Plasti-fab, Inc., Tualatin, Oreg.

Filed Jul. 18, 1983, Ser. No. 514,566
Int. Cl.[3] F16K 3/12, 3/312
U.S. Cl. 251—326 6 Claims



1. An open channel gate valve comprising a gate blade and a frame,

said gate blade being arranged normal to the fluid flow path through the valve,

said frame being provided with a pair of parallel grooves to slidably receive parallel side margins of the gate blade, to guide the blade between open and closed positions,

seat means including a pair of converging seats carried by the frame in offset relation to the plane of the gate blade,

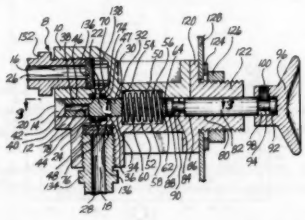
said seat means providing first contacting surfaces facing generally inwardly toward one another,

sealing means carried by one face of the gate blade in offset relation to the plane of the gate blade, said sealing means having second contacting surfaces facing generally outwardly for contacting said first contacting surfaces in a direction contained in a plane normal to the fluid flow path as the blade moves to a closed position.

4,524,951
CENTER-POSITION BIASED SLIDE VALVE

Charles J. Green, Vashon, and Alan K. Forsythe, Burton, both of Wash., assignors to GT Development Corporation, Tukwila, Wash.

Filed Jun. 15, 1981, Ser. No. 273,664
Int. Cl.[3] F15B 13/04; F16K 3/02
U.S. Cl. 251—327 22 Claims

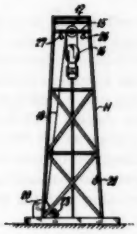


4. In a valve mechanism, a valve housing having a slide valve chamber and an adjoining spring chamber of larger cross section than the slide valve chamber providing a shoulder at the junction of the spring chamber with the slide valve chamber, slide valve means movably mounted in the slide valve chamber and having a rectangular portion adjacent to the spring chamber, said valve housing being formed of two parts adjacent to opposite faces of the slide valve means, said housing parts having elongated mating surfaces and cooperating to form the slide valve chamber, said valve housing being formed with at least one valve port controlled by the slide valve means, said valve housing also being formed with an opening at one end leading from the slide valve chamber to the outside of the housing, and the slide valve means including operating means passing through said opening for operating the slide valve means from outside the housing, spring means in the spring chamber arranged to engage the rectangular portion of the slide valve means and said shoulder, said spring means urging the slide valve means in a predetermined direction and being stopped by the shoulder, said spring chamber being located in the housing between the valve port and the opening for the operating means.

4,524,952
SAFETY SYSTEM FOR AN OIL WELL DERRICK

Gerald F. Rome, Houston, and Frank L. Lankford, Jr., Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 18, 1984, Ser. No. 611,658
Int. Cl.[3] B66D 1/48, 1/36
U.S. Cl. 254—269 7 Claims



1. Safety system for an oil well derrick or the like having a stationary block, a traveling block and drawworks for raising and lowering said traveling block within a normal range, said drawworks including means for stopping movement of said traveling block, comprising

first electrical sensing means adjacent to said stationary block for sensing the presence of said traveling block,

second electrical sensing means located adjacent to a predetermined lower limit of travel of said traveling block,

actuating means for said stopping means,

alarm means for warning prior to activating said actuating means,

first circuit means for connecting said first and second sensing means to said actuating means,

said first circuit means comprising a) manual means for deactivating said actuating means whereby said traveling block may be released for travel beyond either said first or second sensing means, and b) means for automatically reactivating said actuating means when said traveling block has returned to said normal range,

second circuit means for connecting said first and second sensing means to said alarm means whereby said alarm means will be actuated before said actuating means for said stopping means.

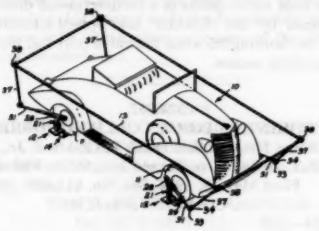
4,524,953
ADJUSTABLE PROTECTIVE ROPE BARRIER

Roger W. Phillips, and Ann L. Phillips, both of 8030 E. Township Rd. 88, Bloomville, Ohio 44818

Continuation-in-part of Ser. No. 304,771, Jul. 23, 1981, abandoned. This application Apr. 22, 1982, Ser. No. 370,874
Int. Cl.[3] A01G 17/06
U.S. Cl. 256—23 15 Claims

1. An adjustable protective barrier standard for use in supporting a portion of an elongated barrier member which fences off an article to be displayed comprising a base member, post

means mounted on and extending generally vertically to said base member, said post means including first and second portions, joint means vertically spaced from said base member adjustably connecting said first and second portions, locking means associated with said joint means for securing said first and second portions of said post means in angularly adjustable position, said first portion of said post means being attached to said base member and extending to said joint means, said second portion of said post means having first and second ends, said first end being connected to said joint means, sleeve means



fixed to said second end of said second portion of said post means in a manner such that the axis of the sleeve means is generally disposed in angular relationship ot the axis of said post means, at least one laterally extending elongated support means supported by said sleeve means and being axially adjustable outwardly relative thereto while being continuously supported thereby and retainer means for receiving and supporting a portion of the elongated barrier member carried by said elongated support member so that said barrier member is maintained in spaced relationship with the article being displayed.

4,524,954

METHOD OF OPERATING A MIXER TYPE HOT METAL CAR FOR THE TRANSPORT OF MOLTEN IRON AND A DEVICE FOR CARRYING OUT THE METHOD

Willem Baas; Tette Hof, both of Heemskerk, Netherlands; Heinrich Comes, Borken, Fed. Rep. of Germany; Helmut Jaunich, Raesfeld, Fed. Rep. of Germany, and Hubert Krampe, Reken, Fed. Rep. of Germany, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands and Foseco Trading A.G., Chur, Switzerland

Filed Jan. 27, 1983, Ser. No. 461,389

Claims priority, application Netherlands, Feb. 4, 1982, 8200418

Int. Cl.³ F27D *3/00*

U.S. Cl. 266—45 **6 Claims**

1. A method of operating a transfer vessel for the transport of molten iron comprising the steps of

(a) filling said vessel with molten iron at a charging location at a blast furnace through an opening in said vessel

(b) closing said opening by means of a disposable cover,

(c) moving said vessel to a discharge location at a steel making plant,

(d) treating the iron in the vessel during the journey from the blast furnace to the steel making plant by the use of a lance which is inserted into the vessel through a hole in the said cover,

discharging the molten iron from the vessel in a manner such that at least part of said disposable cover is carried away by the discharging molten iron and is thus lost into the molten iron,

(f) closing the opening of the vessel by means of a further disposable cover,

(g) moving the vessel to a charging location at a blast furnace, and

(h) charging molten iron into the vessel in a manner such that at least part of said further disposable cover is carried away by the charging molten iron and is thus lost into the molten iron.

4,524,955

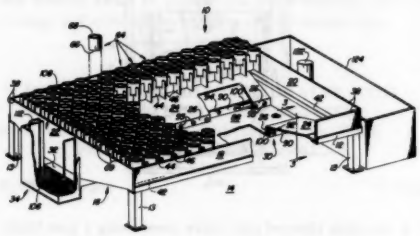
BURNING TABLE

Peter W. Boardman, St. Catharines, Canada, assignor to Deere & Company, Moline, Ill.

Filed Jun. 8, 1984, Ser. No. 618,614

Int. Cl.³ B23K *7/00*

U.S. Cl. 266—49 **28 Claims**



1. A burning table for supporting a workpiece during cutting, said table comprising:

a water tank for providing a preselected water level;

a horizontal grid supported substantially entirely below water level; and

a plurality of individually replaceable tubular elements supported by the grid, each element including a lower end portion extending downwardly into the water and an upper end portion extending above the grid, the upper portions of the elements defining a generally horizontal workpiece support closely adjacent the level of the water.

4,524,956

LINEAR SLIDING CLOSURE UNIT

Herbert Bachmann, Ebikon, Switzerland, assignor to Stopinc Aktiengeselischaft, Baar, Switzerland

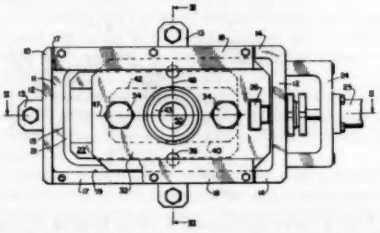
Continuation of Ser. No. 371,486, Apr. 23, 1982, Pat. No. 4,424,958. This application Aug. 24, 1983, Ser. No. 526,131

Claims priority, application Switzerland, May 19, 1981, 3255/81

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.³ B22D *37/00*

U.S. Cl. 266—236 **3 Claims**



1. In a linear sliding closure unit for use in discharging molten metal from a container and of the type including a stationary refractory plate, a closure casing adapted to be mounted on the molten metal container, a linearly movable sliding refractory plate, a sliding closure member mounting said sliding refractory plate for linear sliding movement relative to said

casing and said stationary refractory plate, and means for urging said sliding refractory plate toward said stationary refractory plate so that respective sliding surfaces thereof are in abutment, the improvement wherein:

said closure casing includes an inner supporting surface supporting and defining the position of said stationary refractory plate;

means on said closure casing defining guide surfaces at positions outwardly of said supporting surface;

said sliding closure member includes a sliding carriage adapted to be moved linearly and guided by said guide surfaces during linear sliding movement, a supporting frame separate from said sliding carriage and supporting said sliding refractory plate, and connecting means for connecting said sliding carriage to said supporting frame and thus for transmitting sliding movement of said sliding carriage to said supporting frame and said sliding refractory plate;

said sliding refractory plate is movable with respect to said sliding carriage in a direction transverse to said sliding surfaces and to said direction of sliding movement;

said urging means are mounted on said sliding closure member for sliding movement therewith and urge said sliding refractory plate away from said sliding carriage and toward said stationary refractory plate; and

said closure casing including fixed structure rigidly connecting and spacing said guide surfaces a predetermined fixed distance from said supporting surface.

4,524,957

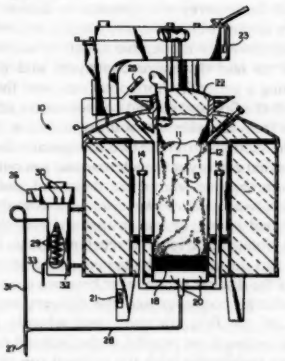
APPARATUS FOR METAL TREATMENT

Robert Staffin, Colonia; Carol A. Girrell, North Brunswick, and Mario A. Fronzoni, East Brunswick, all of N.J., assignors to Procedyne Corp., N.J.

Division of Ser. No. 450,921, Dec. 20, 1983, Pat. No. 4,512,821. This application Jul. 5, 1983, Ser. No. 510,657

Int. Cl.³ C21D *9/00*

U.S. Cl. 266—252 **22 Claims**



1. A fluidized bed apparatus for heat treating metal workpieces in a chemically controlled atmosphere, which comprises:

a heated fluidized bed having a particulate bed media disposed therein and a plenum in fluid communication therewith;

a source of an atmosphere precursor liquid that upon decomposition establishes a desired atmosphere in a fluidized bed;

means external of the fluidized bed and plenum for vaporizing at least one said atmosphere precursor liquid before it enters the plenum;

a means for maintaining the plenum at temperatures greater than the atmosphere precursor liquid vaporization temperature but less than its decomposition temperature; and

means for introducing the vaporized atmosphere precursor liquid into the heated bed causing it to thermally decompose into specific chemical entities thus producing the chemically controlled atmosphere.

4,524,958

APPARATUS FOR CLOSING THE DISCHARGE APERTURE OF A METALLURGICAL VESSEL

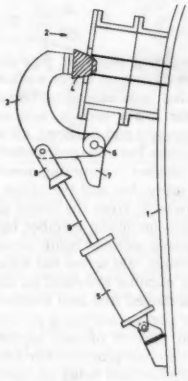
Jean Goedert; Fernand Thill; Romain Henrion, all of Esch; Henri Klein, Niedercorn; Jean-Francois Liesch, Luxembourg, and Jean Peckels, Esch, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Jun. 29, 1983, Ser. No. 509,140

Claims priority, application Luxembourg, Jun. 29, 1982, 84237

Int. Cl.³ C21C *5/46*

U.S. Cl. 266—272 **16 Claims**



9. A method for closing the discharge aperture of a metallurgical tilting vessel prior to and subsequent to tilting utilizing closure apparatus comprising first and second closure element means suitable for one time use, and pivotal lever means having mounting means to temporarily mount the first closure element means at one end thereof and temporarily mount the second closure element means at the same end thereof after said first closure element means has been placed in said discharge aperture, the first and second closure element means having mating means to receive the mounting means, and pressure cylinder means attached by a piston rod to the pivotal lever, the closure method including the steps of:

actuating said pivotal lever means by said pressure cylinder means to seat said first closure element means in said discharge aperture upon actuation of said pressure cylinder means in a first direction prior to tilting;

actuating said pivotal lever means by said pressure cylinder to disengage said mounting means from said first closure element means and leave said first closure element means in said discharge aperture upon actuation of said pressure cylinder means in a second direction, wherein said first closure element means is destroyed when said metallurgical vessel is tilted;

actuating said pivotal lever means by said pressure cylinder means to seat said second closure element means in said discharge aperture upon actuation of said pressure cylinder means in said first direction subsequent to tilting;

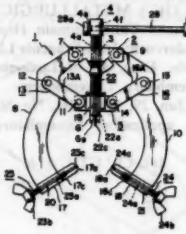
actuating said pivotal lever means by said pressure cylinder to disengage said mounting means from said second closure element means and leave said second closure element means in said discharge aperture upon actuation of said pressure cylinder means in said second direction.

4,524,959

HOLDER OF PIPES OR PIPE JOINTS FOR WELDING

Tetsushi Kubo, 861, Hirata, Ichihara-shi, Chiba-ken, Japan

Filed Aug. 24, 1983, Ser. No. 526,114
Claims priority, application Japan, Aug. 25, 1982, 57-128418[U]
Int. Cl.³ B23K 1/14
U.S. Cl. 269—43 4 Claims



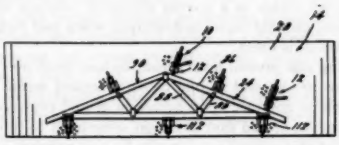
1. Holder for welding pipes or pipe joints comprising a supporting member having an upper surface and a lower surface with a threaded hole extending therethrough from the upper surface to the lower surface, said supporting member having a pair of opposite end portions, an upwardly arranged axially extending screw bar engaged within the threaded hole in said supporting member, a mounting member mounted at the lower end of said screw bar and the lower end of said screw bar projects downwardly from the lower surface of said supporting member, said mounting member having a pair of end portions, said mounting member being movable upwardly and downwardly by turning said screw bar about the axis thereof, a first pipe abutting member provided on said mounting member, an upwardly arranged first arm member having an upper portion and a lower portion and being pivoted at the upper end thereof to one end portion of said supporting member, an upwardly arranged second arm member having an upper portion and a lower portion and being pivoted at the upper end thereof to the other end portion of said supporting member, a first link having a pair of opposite ends with one end pivoted to one end portion of said mounting member and the other end pivoted to the upper portion of said first arm member, a second link having a pair of opposite ends with one end pivoted to the other end portion of said mounting member and the other end of said second link pivoted to the upper portion of said second arm member, a second pipe abutting member provided at the lower end of each of said first arm member and second arm member, each of said first and second pipe abutting members having a threaded hole extending therethrough, and a pipe supporting screw bar mounted in each said threaded hole in said first and second pipe abutting members.

4,524,960

ADJUSTABLE JIG

Robert A. LePoire, 2200 Barritt, Lansing, Mich. 48912

Continuation-in-part of Ser. No. 245,970, Mar. 20, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 507,300
Int. Cl.³ B25B 1/10
U.S. Cl. 269—45 6 Claims



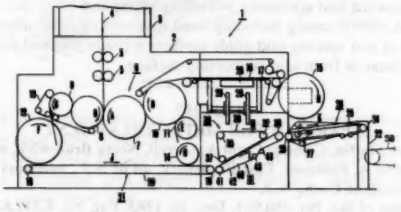
1. An adjustable jig for use in maintaining the correct positional relationship between components of work during assembly thereof on a workpiece support, said support being in the form of a flat plate formed of magnetic material and defining a plurality of spaced passageways opening upon an exterior surface of said support, said jig comprising, in combination, a base, permanent magnet means carried by said base and magnetically attractable to said support, said base defining an elongate channel, an adjustable block mounted for longitudinal movement in the channel defined by said base, pin means carried by said block and adapted to be received selectively in the passageways defined by said support to mechanically connect said base to said support, and means for advancing and retracting said block in the channel defined by said base.

4,524,961

PAPER DISCHARGE APPARATUS FOR USE IN PAPER FOLDERS OF ROTARY PRESSES

Yosihide Suzuki, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 246,739, Mar. 23, 1981, abandoned. This application May 2, 1983, Ser. No. 490,661
Claims priority, application Japan, Apr. 2, 1980, 55-44926[U]
Int. Cl.³ B41F 13/58
U.S. Cl. 270—4 5 Claims



1. A paper discharge apparatus for use in a paper folder of a rotary press comprising a system of conveyors wherein there is a discharge conveyor and first and second conveyors so arranged that said first conveyor is operable to deliver sections from one source to the discharge conveyor and in combination with said second conveyor is operable to deliver sections from another source to said discharge conveyor, said discharge conveyor defining a generally horizontal run onto the receiving end of which the first and second conveyors are adapted to deliver sections from said alternate sources and from the other end of which the sections from the two sources are discharged and wherein the first conveyor has a horizontal run onto which the sections from the one source are deposited and an end adjacent the receiving end of the discharge conveyor, and wherein the second conveyor has an inclined run, the lower end of which is situated at a level to receive sections from the second source and an upper end situated at the level of the receiving end of the discharge conveyor between the receiving end of the discharge conveyor and the delivery end of the horizontal run of the first conveyor and wherein the first conveyor has an inclined run parallel to the inclined run of the second conveyor cooperable with the inclined run of the second conveyor to move a section delivered to the lower end of the second conveyor to the upper end thereof and from thence onto the receiving end of the delivery conveyor, means for driving the respective conveyors comprising means for driving the first conveyor in a direction such that the upper horizontal run moves in a direction toward the receiving end of the discharge conveyor when delivering sections deposited thereon to the discharge conveyor, means for driving the second conveyor in a direction such that the inclined run moves upwardly toward the receiving end of the discharge conveyor when moving sections delivered to the lower end thereof to the receiving end of the discharge conveyor and wherein there are change gears for reversing the direction of movement of the first conveyor without changing the direction of movement of

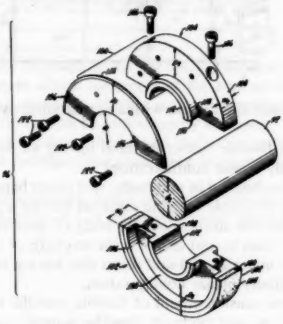
the second conveyor to cause the inclined run of the first conveyor to travel in the same direction as the inclined run of the second conveyor to in combination therewith move sections delivered to the lower end of the second conveyor to the upper end thereof onto the receiving end of the discharge conveyor.

4,524,962

PRE-FOLD, WEB SCORING APPARATUS FOR SIGNATURE FOLDING MACHINES

Harold D. Davenport, La Mirada, and Anthony J. DeVito, Huntington Beach, both of Calif., assignors to Penn Lithographics, Inc., Cerritos, Calif.

Filed Sep. 7, 1984, Ser. No. 648,379
Int. Cl.³ B41F *13/56*
U.S. Cl. 270—21.1 **31 Claims**



1. In a printing system in which a continuous web of paper is printed and is then fed into a signature folding machine having a first folding stage in which sheets cut from the web are serially folded crosswise to the direction of web travel into the first folding stage and having a second folding stage wherein the folded sheets from the first folding stage are folded at right angles to the first stage fold, prefold scoring apparatus which comprises:

(a) scoring means for prefold scoring of the paper in alternating directions along a longitudinal line corresponding to the second stage fold line,

said scoring means including mating first and second scoring members each having separate scoring and resilient abutment portions configured for causing the lengths of the paper scoring in each alternating direction to be equal to the length of the second stage fold and for causing the paper to be scored in directions corresponding to the folding directions of each paper layer in the second folding stage; and

(b) means for mounting the scoring means in the path of paper travel intermediate the printing press and the signature folding machine first folding stage so as to enable scoring of the paper before the paper enters the first folding stage.

4,524,963

DOCUMENT HANDLING DEVICE

Kenneth R. D'Angelo, Bridgewater, and Timothy T. Childress, Manchester, both of Conn., assignors to Scan-Optics, Inc., East Hartford, Conn.

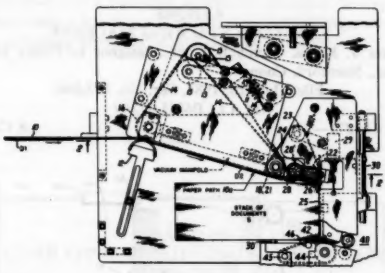
Filed Jan. 17, 1983, Ser. No. 458,573
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—3.1 **14 Claims**

1. A document handling device for documents movable along one of their edges, said device comprising a stacker section and a feeder section, wherein said stacker section includes:

transporting means for receiving documents moving upright on one of their edges, and for moving said documents longitudinally to a first position;

stop means for intercepting said document at said first position; and

means for moving said document from said first position transversely to a stacking position, wherein said stacker section is arranged to receive successive documents in a series of documents, and position each successive document, in an upright position, behind the succeeding document to form an edgewise stack of documents; and wherein said feeder section includes:



feeder means for engaging the front document of said stack of documents for selectively removing the front document from a stack of documents, and for moving the front document from said stack in an upright manner along one edge, wherein said stacker section and said feeder section are arranged to support a stack of documents therebetween; and

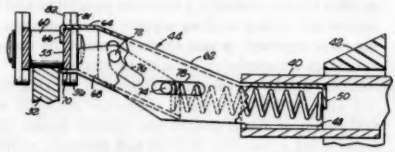
means for selectively actuating said feeder means for feeding the front document from the stack in an upright position, wherein said feeder means is slidably mounted on guide shafts so as to be laterally displaceable toward and away from said stacker section.

4,524,964

APPARATUS FOR TRANSFERRING PRINTED MATERIAL ONTO A CHAIN DELIVERY

H. William Jamieson, Jr., Encino, Calif., assignor to Offset Engineering, Inc., Encino, Calif.

Continuation-in-part of Ser. No. 104,500, Dec. 17, 1979, Pat. No. 4,369,963. This application Sep. 29, 1982, Ser. No. 426,561
Int. Cl.³ B65H *29/04*
U.S. Cl. 271—204 **11 Claims**



1. In apparatus for preventing the smudging of a sheet as it is guided onto a chain delivery mechanism, said apparatus being generally of the type including a bar having a pair of clips at opposed ends for engaging the continuous chains of the chain delivery and at least one paper contacting member mounted and longitudinally adjustable upon said bar, the improvement comprising said clips including:

(a) an outer body member, said member including a first flange;

(b) a jaw member insertable within said outer body member, said jaw member including a second flange;

(c) said outer body members and said jaw members being arranged so that said first and second flanges are substantially parallel; and

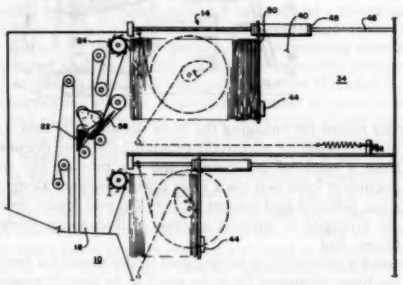
(d) means for urging said flanges together for applying a substantially vertical compressive retaining force to the side members of pre-selected links of said chains.

4,524,965

ENVELOPE STACKING MACHINE

Walter J. Kulpa, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 25, 1984, Ser. No. 573,898
Int. Cl.³ B65H *31/04*
U.S. Cl. 271—214 **8 Claims**



1. An envelope stacking machine comprising:

A. conveyor means for feeding a plurality of substantially vertically oriented envelopes in succession along a predetermined path of travel,

B. an elongate envelope stacking support disposed adjacent said conveyor means with its longitudinal axis substantially perpendicular to said path of travel,

C. transfer means for intercepting envelopes moving along said path of travel and for redirecting said envelopes for movement along said stacking support,

D. envelope abutment means mounted on said stacking support for movement in a direction parallel to said longitudinal axis of said stacking support in response to a pushing force imposed on said abutment means by successive envelopes accumulating on said stacking support,

E. resilient means interposed between said stacking support and said movable abutment means for normally urging said abutment means toward said transfer means, thereby maintaining a resisting force on said abutment member in opposition to said pushing force imposed thereon by said envelopes, and

F. force converting means interconnected between said resilient means and said movable abutment means for preventing said resisting force from increasing as said resilient means expands in response to movement of said abutment means away from said transfer means,

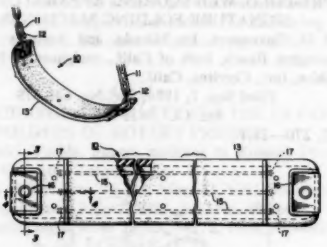
whereby said abutment means exerts a uniform or gradually decreasing degree of resistance, during movement of said abutment means away from said transfer means, to the transfer of envelopes from said conveyor means to said stacking support to prevent envelopes from jamming at said transfer means.

4,524,966

SEAT FOR RECREATIONAL SWING SET

William H. Shannon, Mentone, and Wesley D. Sutton, Jr., Fort Payne, both of Ala., assignors to Game Time, Inc., Fort Payne, Ala.

Filed Aug. 24, 1983, Ser. No. 525,872
Int. Cl.³ A63G *9/00*; A47D *13/10*
U.S. Cl. 272—85 **26 Claims**



1. A seat suitable for use with a recreational swing set comprising:

a body of flexible rubber material having an elongated substantially planar configuration,

an insert embedded in said body, said insert being formed of a band of pliable metallic material having a greater stiffness than the stiffness of said body of flexible material to impart form to and enhance the strength of said body of flexible material, and said insert also having an elongated, substantially planar configuration,

at least one tension strand of flexible metallic material embedded in said body of flexible material and disposed generally longitudinally relative to said planar configurations,

said tension strand having opposite spaced tension strand end portions, each said tension strand end portion being provided with an eyelet,

a tensioning and securing means associated with said insert and with said tension strand for securing said end portions to said insert and for holding said tension strand in constant tension, and including said eyelets being welded directly to said insert, and

a connecting means disposed at both end portions of said body of flexible material for connecting said end portions to a pair of depending members of a recreational swing set,

said connecting means each including an opening through an end portion of said body of flexible material, a U-shaped base member straddling said end portion, and a grommet disposed in said opening and rigidly secured to said U-shaped base member.

4,524,967

ACTION MATCHING GAME

Steven P. Hanson, Winnetka, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1984, Ser. No. 578,053
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—1 GE **16 Claims**

1. A game comprising:

a housing with means establishing an upwardly disposed playing surface;

motor means mounted within the housing;

cam means driven by the motor means;

a cam follower disposed between the cam means and the playing surface;

the cam follower having an upwardly disposed supporting surface essentially parallel to the playing surface;

means mounting the cam follower within the housing for

movement of the supporting surface substantially perpendicular to the playing surface;

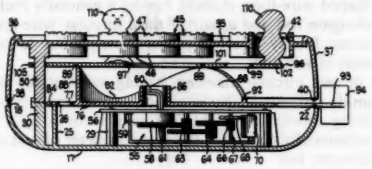
a plurality of openings extending through the playing surface;

a first set of pieces, each piece having a bottom surface, insertable into the openings and seatable upon the cam follower supporting surface;

the cam means moving the cam follower between a first position in which all of the pieces of the first set are substantially disposed below the playing surface and a second position in which the pieces of the first set are generally exposed above the playing surface permitting each piece of the first set to be picked up by a player;

identifying means on the bottom surface of each piece of the first set distinguishing each piece from every other piece; and

the identifying means being obscured while the pieces of the first set are seated on the cam follower supporting surface.



4,524,968

DEVICE FOR ACCOMMODATING BILLIARD BALLS IN SPACES PROVIDED FOR BILLIARDS PLAYING

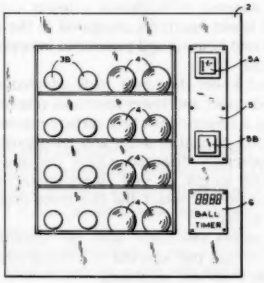
Heinrich Dölp, Kimbacher Strasse 211, D-6123 Bad König, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,127

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304439

Int. Cl.³ A63D *15/00*

U.S. Cl. 273—2 **14 Claims**



1. A device for keeping ready billiard balls in spaces provided for billiard playing, comprising a housing having a front side; holding means for holding billiard balls and having a plurality of holding elements arranged at said front side in spaced relationship from one another so as to receive therein billiard balls, each of said holding elements having a center point for a billiard ball; contact means arranged to cooperate with the billiard balls and having a plurality of contact elements each located behind a respective one of said holding elements and having an actuating member which is spaced from the center point of the associated holding element by a distance which is smaller than a radius of the billiard ball, each of said actuating members having a permissible displacement path for the associated contact element; limiting means provided behind said contact means for limiting the horizontal displacement of billiard balls so that the end of the displacement path of the billiard balls limited by said limiting means is located prior to the end of the permissible displacement path of said actuating members; indicating means provided on said front side of said housing and arranged to indicate a remaining game time; and a yieldable membrane arranged between the billiard balls when they are received in said holding means and said actuating members of said contact elements.

4,524,969

BILLIARD APPARATUS HAVING SENSORS IN LIEU OF POCKETS

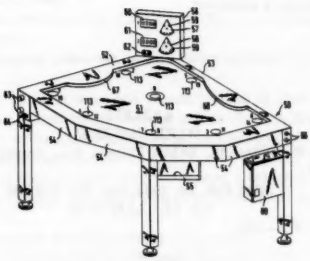
Horst Erzmoneit, Fredenbecker Strasse 36, 2741 Kutenholz, Fed. Rep. of Germany

Continuation of Ser. No. 416,179, Sep. 9, 1982, abandoned. This application May 21, 1984, Ser. No. 611,939

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135846

Int. Cl.³ A63D *15/00*

U.S. Cl. 273—3 R **26 Claims**



1. A billiard apparatus comprising: a planar playing area **(110, 51)**, a cushion **(120, 52, 53, 54)** bordering said playing area, a plurality of pocket fields **(113)** positioned adjacent said cushion; and least one playing field **(113)** positioned in the interior of said playing area, said pocket fields and playing field being disposed in the plane of the playing area and each having a contactless sensor **(115)** associated therewith responsive to the presence of a billiard ball, said sensors being coupled to a visual indicator device **(56)**.

4,524,970

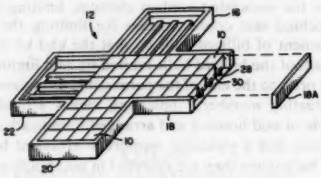
Patent Not Issued For This Number

4,524,971

TWO DIMENSIONAL PUZZLE

Albert Sasso, 8 Rall Ct., Roseland, N.J. 07608

Filed Dec. 1, 1982, Ser. No. 445,898
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **15 Claims**



1. A two dimensional puzzle, comprising:

a planar board defined by a centrally disposed relatively large square and four squares of the same size as the centrally disposed square, each of the four squares having an edge common with an edge of the centrally disposed square;

a plurality of movable pieces carrying indicia and disposed on the planar board, said pieces being relatively small squares, each of the same size and initially positioned in equal numbers on the centrally disposed square and two of the four squares to fill said squares;

means for retaining the movable pieces in a plurality of sets each of which includes a predetermined number of pieces, with the pieces movable only in the sets on the planar board, with successive movements of the sets positioning any piece of any set at any point on the planar board;

the pieces being moved in the sets of a predetermined number of pieces in two mutually perpendicular directions on the planar board; and

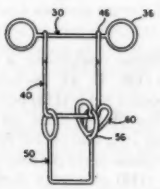
the sets being successively moved on the planar board with the pieces retained in the sets until a predetermined indicia pattern is achieved.

4,524,972

WIRE PUZZLE

Charles R. Wilmarth, 88340 Thienes La., Springfield, Oreg. 97477

Filed Feb. 10, 1984, Ser. No. 579,104
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—158 **1 Claim**



1. A wire-form puzzle comprising

first capture means including a first U-shaped planar wire-form element having a generally rectilinear first transverse portion and a pair of generally rectilinearly equal length first arm portions extending substantially in parallel and substantially normally from the ends of said first transverse portion; and a pair of planar first circular wire-form elements attached at their peripheries to the free ends of said first arm portions, the two lanes defined by the circular elements being mutually parallel and perpendicular to said first transverse portion;

second capture means constructed with substantially the same form as said first capture means including a second U-shaped element having a second transverse portion and a pair of second arm portions, and a pair of second circular elements; said second U-shaped element being sized to be receivable within the inner dimensions of said first U-shaped element;

third capture means including a generally planar dumbbell-shaped wire-form element having a generally rectilinear, elongate rod and a pair of third circular wire-form elements fixedly attached at their peripheries to opposite ends of said rod;

all of said circular elements having substantially uniform inside and outside diameters and said second arm portions being shorter than said first arm portions by a length substantially equal to ½ the outer diameter of said circular element; and

captured means including a planar heart-shaped wire-form element having a pointed tip formed in one side and a pair of adjacent arcuate outward-extending lobes surrounding an inward extending cleavage formed in an opposing side, said heart-shaped element being sized for clearance passage through said circular elements about its tip and cleavage and further being sized for clearance passage about said circular elements between its tip and either lobe;

wherein the puzzle is constructed such that said first U-shaped element is unremovably and movably received within the circumferences of said second circular elements, said second capture means being trapeze-like swingable on said first U-shaped wire-form element; and

said elongate rod is unremovably and movably received within the circumferences of said first circular elements; said captured means being threadable about and through said capture means elements between a location external of said capture means and a location wherein said second U-shaped element is received internally of said captured means, the puzzle being constructed such that said second transverse portion must be swung to a position adjacent said first circular elements to effect puzzle solution.

4,524,973

GRIP-CORRECTING GOLF CLUB HANDLE

William G. Sterbik, 11101 Continental Ave., Cleveland, Ohio 44104

Filed Jul. 2, 1984, Ser. No. 627,010
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—183 D **3 Claims**

1. A golf club handle comprising:

(a) a tubular housing having a curved sidewall, an upper extremity adapted to be closed, a lower extremity, and upper and lower apertures elongated in the direction of the axis of said housing and positioned in opposite sides of said sidewall,

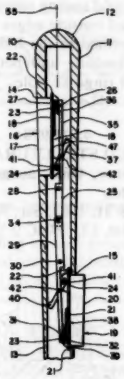
(b) upper and lower depressor pads adapted to slideably engage said upper and lower apertures respectively, each pad having a finger-contacting surface extremity extending exteriorly of said housing and an opposed inwardly directed extremity disposed within the interior of said housing, the length of said finger-contacting surfaces being adequate to contact the last three fingers of each hand of a golfer,

(c) retainer means associated with the inwardly directed extremity of each pad adapted to prevent disengagement of said pads from said apertures,

(d) upper and lower spring means located within said housing in association with each pad and adapted to urge each respective pad outwardly from said housing, the force of said upper spring means being greater than the force of said lower spring means, and

(e) upper and lower levers located within said housing, each having upper and lower extremities, the upper extremity

of said upper lever being movably associated with said upper pad, the lower extremity of said lower lever being movably associated with said lower pad, the lower extremity of said upper lever and upper extremity of said lower lever being pivotably and movably interengaged, whereby

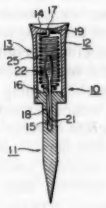


(f) inward movement of the upper pad against the urging of its spring means causes outward movement of said lower pad, and conversely, inward movement of said lower pad against the urging of its spring causes outward movement of said upper pad.

4,524,974
GOLF TEE

Norio Matsuura, 6-10-16, Mino-o, Mino-o city, Osaka, Japan (562)

Filed Jan. 16, 1984, Ser. No. 570,885
Claims priority, application Japan, Feb. 22, 1983, 58-23839[U]
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—207 **1 Claim**



1. A golf tee (10) comprising in combination:
(a) an elongated cylindrical peg member (11) with a top section and a pointed lower end designed to be placed vertically in the ground, said top section including an outer flange and an inner stepped portion;
(b) a cylindrical head member having a concave cup-shaped top, designed to receive a golf ball and a cylindrical hollow body portion in said head member, said body portion supporting said top, an anchor hole (17) at the inner bottom of said concave cup-shaped top, a circular open bottom to said hollow body portion resting on said flange and over the stepped portion;
(c) an axial center space in said peg member, a plastic knob (22) with a stem portion, said stem portion being held in said center space, and the knob (22) protruding into the hollow body portion; and,
(d) a plastic coil spring (12) having one end held by said stem in said space (15) and the other end extending through said axial bore to the anchor hole (17), the diameter of the coil spring (15) being greater than that of the knob (22); whereby when a golf ball is hit on the tee, the head member will tend to fly off but is restrained by the spring, and, to pull the peg of the golf tee out of the ground, the knob is used to avoid distending the plastic coil spring.

4,524,975
FOOTBALL GAME BOARD

Keith E. Caughie, 709 G St., and Kenneth L. Caughie, 4545 N. Petaluma Blvd, #7, both of Petaluma, Calif. 94952

Filed Jun. 29, 1983, Ser. No. 508,820
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—247 **11 Claims**

1. A football type board game comprising:
a game board marked to simulate a football field with goal posts at each end;
a game piece representing a football to be moved along the game board;
a referee random selection means to be utilized on every play;
said referee random selection means having at least eight facets, one of said facets bearing indicia thereon denoting a penalty, other facets being unmarked to indicate a play unaffected by an official's call; and
a plurality of play random selection means, a selected one of said play random selection means to be utilized on each play;
said play random selection means comprising:
a plurality of multi-sided scrimmage dice, the sides of each bearing indicia thereon denoting yardage;
some of said sides bearing indicia thereon denoting rushing yards, the other of said sides bearing indicia thereon denoting passing yards;
said rushing yards displayed to be totalled to determine yards gained when a rushing play is called prior to display, and said passing yards displayed to be totalled to determine yards gained when a passing play is called prior to display;
and a plurality of kicking random selective devices to be used selectively in kicking situations;
said game further including:
a set of rushing penalty cards to be drawn from on a rushing play from scrimmage upon random selection of a penalty facet by use of said referee random selection means;
a set of passing penalty cards to be drawn from on a passing play from scrimmage upon random selection of a penalty facet by use of said referee random selection means; and
a set of kicking penalty cards to be drawn from on a kicking

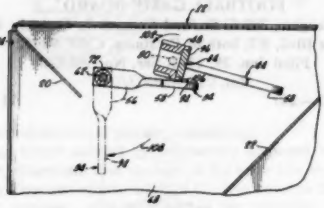
play upon selection of a penalty facet by use of said referee random selection means.

4,524,976

MAGNETIC TARGET ASSEMBLY

Fred H. Seitz, Yorba Linda, and Max J. Jaschke, Villa Park, both of Calif., assignors to Air Cabin Engineering, Fullerton, Calif.

Filed Dec. 13, 1983, Ser. No. 560,986
Int. Cl.³ F41J 7/04
U.S. Cl. 273—388 **9 Claims**



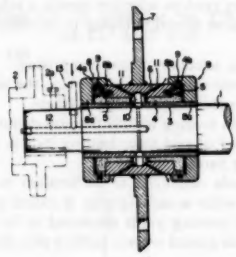
1. A remotely resettable target assembly comprising:
a plurality of spaced apart individual targets pivotally mounted on a generally horizontal axis and suspended therefrom when the individual targets is in a set position, said individual targets being configured for rotation to an unset position when struck by a projectile;
a master target pivotally mounted on a generally horizontal axis; and
magnetic means disposed in an operative position for holding each individual target in an unset position after said individual target has been moved to an unset position, said magnetic means being in an operative relationship with said master target for releasing each individual target when said master target is struck by a projectile.

4,524,977

UNDERWATER BEARING PROTECTION DEVICE

Nagashima Masaaki, 272-Oyama, Chiba-ken, Japan (271)

Filed Dec. 8, 1983, Ser. No. 559,206
Int. Cl.³ F16J 15/40
U.S. Cl. 277—3 **21 Claims**



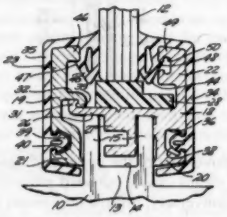
1. An underwater bearing protection device comprising:
a fixed shaft,
a sleeve attached on the said fixed shaft,
a bushing rotatably mounted on said sleeve, a hub fixed around the outside of the bushing,
collars having inside edges attached on said sleeve and outside edges respectively covering the both sides of said hub, and sealing members having bases attached on the both edges of said hub or the outside edges of said collars and lips respectively contacted to the outside edges of said collars or the both edges of the hub,
whereby clean water is supplied to a ring-like hole formed in the bushing and hub through a center water supplying passage formed in the center of said fixed shaft and a water passage of said sleeve from a water pipe attached outside said fixed shaft and is supplied to clean water pressure portions between said sealing members and the both edges of the hub and said outside edges of said collars through water passages formed in the hub or gaps between said sleeve and said bushing and between said collars and bushing from said ring-like hole.

4,524,978

SIMULATED STRUCTURAL GASKET

Richard J. Mauser, Stow, Ohio, assignor to Ampat/Midwest Corp., Cleveland, Ohio

Filed Aug. 31, 1983, Ser. No. 528,082
Int. Cl.³ E04C 2/00
U.S. Cl. 277—189 **10 Claims**



1. A simulated structural gasket for supporting a panel within an opening defined by a building frame, the frame having a flange surrounding the opening, the simulated gasket comprising:
first and second elongated metal members each having a flange-engaging portion extending along the length of the building frame flange, said portions engaging opposite sides of the flange,
each of the elongated members having a panel-supporting portion extending beyond the free edge of the flange into the opening surrounded by the flange, an edge of the panel within the opening being located between the panel-supporting portions of the elongated members,
a cross-member projecting laterally from the first elongated member toward the second elongated member, the cross-member overlying the building frame flange,
cooperable locking means carried by the second elongated member and the cross-member for preventing movement of the elongated members away from each other, and
a layer of resilient material covering the outer surface of each elongated member, each resilient layer having a gasket portion located between the panel-supporting portion of its respective elongated member and the panel being supported.

4,524,979

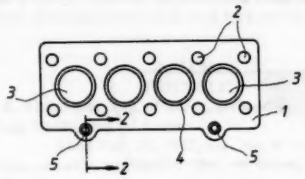
CYLINDER HEAD GASKET FOR INTERNAL COMBUSTION ENGINES

Armin Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,628
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321425
Int. Cl.³ F21B 5/00
U.S. Cl. 277—189 **6 Claims**

1. A cylinder head gasket for disposition between a cylinder head and a cylinder block of an internal combustion engine.

said cylinder head and block having corresponding cylinder bores, coolant bores for a liquid coolant, and one of said cylinder head and cylinder block having gasket bores, said gasket comprising:



a plate with openings corresponding to said cylinder and coolant bores; and

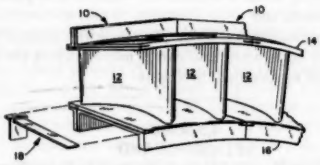
elements corresponding to said gasket bores, said elements being affixed to said plate and being shaped to frictionally engage said gasket bores thereby positioning said gasket.

4,524,980

INTERSECTING FEATHER SEALS FOR INTERLOCKING GAS TURBINE VANES

Herbert J. Lillibridge, Plainville, and Russell A. Schwarzmann, Marlborough, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 5, 1983, Ser. No. 558,401
Int. Cl.³ F16J *15/08*
U.S. Cl. 277—199 **1 Claim**



1. An interlocking feather seal comprising a pair of relatively thin flat plate-like elements, one of said elements having an aperture fitting into a pair of diametrically opposed slotted sections of the other of said pair of plate-like elements, each being restrained axially relative to each other and each having limited rotary movement relative to each other, one of said pair of plate-like elements having a portion extending radially from the face of the other of said pair of plate-like elements, whereby said interlocking feather seal fits into intersecting grooves formed in abutting members intended to be sealed, providing both radial and axial sealing capabilities.

4,524,981

ANNULAR SEAL WITH V-CUT

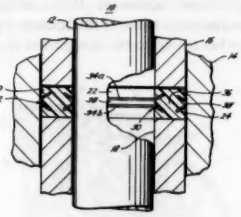
Daniel L. Hertz, Jr., Red Bank, N.J., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 22, 1983, Ser. No. 554,188
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—210 **16 Claims**

1. An annular, compression-actuated, elastomer seal member for forming a compression-type seal between concentric, generally cylindrical surfaces and for transforming the compression-type seal to a lip-type seal on relaxation of strain within said seal member, comprising:

a first seal face for sealingly engaging a first of such generally cylindrical surfaces, said first seal face being sized in its relaxed state substantially to engage, but not form an effective fluid seal against, such first surface; and

a first circumferential groove in said first seal face, said first groove, when viewed in radial cross section, forming an acute angle with respect to a portion of said first seal face



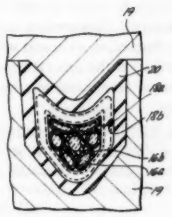
which is axially downstream of the intersection of said first groove with said first seal face.

4,524,982

SEAL FOR AGGRESSIVE ENVIRONMENTS

Daniel L. Hertz, Jr., Red Bank, N.J., assignor to Seals Eastern Inc., Red Bank, N.J.

Filed Dec. 27, 1983, Ser. No. 566,090
Int. Cl.³ F16J *9/20, 15/22*
U.S. Cl. 277—229 **11 Claims**



1. A seal for use in aggressive environments, comprising:

a ring-shaped core including a winding of asbestos yarn impregnated with an elastomeric material, the winding including a multiplicity of turns of a single length of the yarn, each turn extending in the circumferential direction of the core, and the core being continuous and having no joint transverse to its circumferential length, and

a helical winding surrounding and extending along the entire length of the core, the helical winding including an asbestos yarn impregnated with an elastomeric material capable of resisting the aggressive environment.

4,524,983

COORDINATED LATHE CHUCK

J. Kellogg Burnham, P.O. Box 5601, Chula Vista, Calif. 92010-5601

Filed Aug. 27, 1982, Ser. No. 412,089
Int. Cl.³ B23B *31/16*
U.S. Cl. 279—110 **23 Claims**

1. A lathe chuck comprising a chuck body having a central bore and a plurality of openings disposed radially outward from the bore;

a jaw screw rotatably mounted in each of said openings;

a gripping jaw associated with each of said jaw screws;

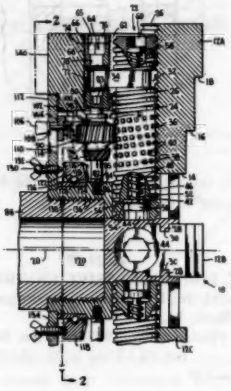
first cooperating thread means joining each jaw screw with its respective gripping jaw for moving the gripping jaw radially in relation to the bore;

a locater screw mounted adjacent said jaw screw in each of said openings;

second cooperating thread means joining said locater screw

to said chuck body for moving the locater screw radially in relation to the bore;

a locater bracket extending between each jaw screw and its respective locater screw in their respective opening whereby radial movement of the locater screw causes the locater bracket to move the jaw screw in a radial move-



ment; and wherein each of said jaw screws includes a contoured internal passageway and a spring biased slidable plunger housed therein and wherein said passageway terminates adjacent the central bore in a contoured socket and said plunger terminates in a head adapted to be fitted in said socket.

4,524,984

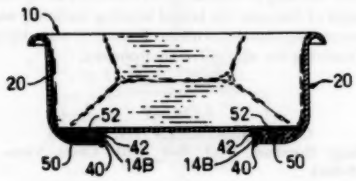
CONTROLLABLE SLED FOR SNOW SKIING

Peter W. Axelson, 5858 Empire Grade, Santa Cruz, Calif. 95060

Filed Aug. 19, 1980, Ser. No. 179,562

Int. Cl.³ B67B *13/02*

U.S. Cl. 280—18 **10 Claims**



1. In a controllable ski sled for use on ski slopes, or the like, comprising a unitary body which includes a bottom member formed with a pair of parallel downwardly extending runners along opposite sides thereof, said body including front, rear and opposite side walls extending upwardly from said bottom member and which terminate at the upper edge substantially in a plane extending generally parallel to said runners, said side walls tapering inwardly at the rear thereof and said rear wall slanting downwardly from the top to provide a reduced size sled rear end insertable through the back rest of a chair lift seat for stable support of the sled and sled occupant on the chair lift seat.

4,524,985

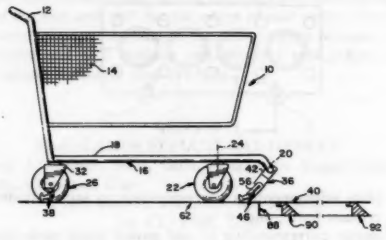
CART ANTI-THEFT DEVICE

Daniel Drake, 1915½ Addison St., #104, Berkeley, Calif. 94704

Filed Apr. 12, 1983, Ser. No. 484,219

Int. Cl.³ B62B *39/00*

U.S. Cl. 280—33.99 C **27 Claims**



1. An arrest device for a wheeled cart comprising

a hook,

connecting structure adapted to mount said hook on the cart, said structure including pivoting means adapted to accommodate swinging of said hook in a front-to-back direction with respect to the cart, and shifting means adapted to be shiftable with respect to the cart to accommodate shifting of said pivoting means between lowered and raised positions, said connecting structure also including a leg having said hook pivotally attached thereto by said pivoting means for pivoting about one axis, said leg being pivotally attached to the cart by said shifting means for pivoting about a second axis substantially parallel to the first axis, and

hooking means adapted to be placed on the ground to engage said hook when said cart is moved across the hooking means in specified directions.

4,524,986

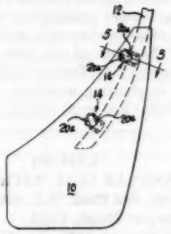
SPLASH GUARD

Douglas K. Ward, Toronto, Canada, assignor to Powerflow, Inc., Buffalo, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,358

Int. Cl.³ B62D *25/16*

U.S. Cl. 280—154.5 R **7 Claims**



1. A clamp for mounting a splash guard to a vehicle fender, comprising:

(a) structure defining a primary support base including a laterally extending back plate means;

(b) spaced apart clamping arms disposed on either side of said back plate means each of said arms including a portion depending away from a plane defined by said back plate means such that a fender receiving gap is defined between said back plate means and portions of said clamping arms;

(c) pin means carried by said base, said base including structure for preventing rotation in said pin means;

(d) lock means engageable with said pin means and including means for urging said clamping legs towards the plane of said back plate means such that a clamping force is applied to a fender received between said back plate means and said clamping arms when said lock means is installed.

4,524,987

TRICYCLES

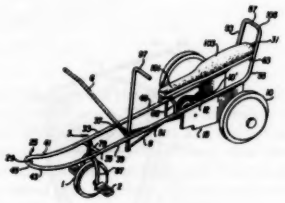
Sang K. Kim, Seoul, Rep. of Korea, assignor to Myung Keun Oh, Kyung Gi-Do Rep. of Korea

Filed Feb. 28, 1983, Ser. No. 470,626

Claims priority, application Rep. of Korea, Feb. 27, 1982, 1506/82[U]

Int. Cl.³ B60D *1/00;* **B62M** *1/14;* **B62K** *5/06*

U.S. Cl. 280—204 **14 Claims**



1. A tricycle (13), comprising a support body (3), forming a frame (14) having levers (6) mounted thereof for opposite reciprocation, lever actuated rear wheels (10) in operable association with the levers (6) and having rear wheel supports (15) mounted on the frame (14), and a front wheel (1) having a front wheel support (17) mounted on the frame (14);

the frame (14) being shaped to provide a low profile, low center-of-gravity seat (19) mounted on the frame (14) for hand actuated lever operation of the back wheels (10) by an operator who also is in a low profile, low center-of-gravity sitting position on the seat (19) for foot steering of the front wheel (1);

said frame (14) also having front and rear ends (21 and 23) forming upwardly directed portions (25 and 27) having fast operation couplings (29 and 31) for selectively and removably connecting the said tricycle to another said tricycle in a train (32)

said frame including parallel bars (33 and 35) having first horizontal portions (37 and 39) in front of the levers and said first horizontal portions having two first upwardly directed front portions (41 and 43) extending to a connection (45) therebetween positioned forwardly of said front wheel forming one of said fast operating couplings (29).

4,524,988

UPRIGHT BICYCLE FOR HANDICAPPED

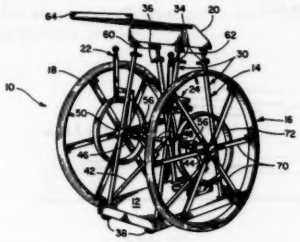
Frederick P. Netznik, 8556 Central Park Ave., Skokie, Ill. 60076

Filed May 12, 1983, Ser. No. 493,929

Int. Cl.³ B62K *3/16*

U.S. Cl. 280—208 **22 Claims**

1. A mobile apparatus for stably maintaining an infirm person in a generally upright position and providing for the self-propelled locomotion of said person, said apparatus comprising: a platform for supporting the feed of said person, said platform adapted for displacement over a surface upon which it is positioned, and wherein a front portion of said platform is raised slightly with respect to a rear portion thereof; a frame positioned on said platform and extending upward therefrom immediately forward of the person supported thereon; first support means mounted to an upper portion of said frame immediately adjacent and in contact with an upper, front portion of the torso of said person positioned on said platform; second support means mounted to an intermediate portion of said frame and extending rearward therefrom so as to engage a lower, rear portion of the torso of said person so as to provide lateral and vertical support for said person in maintaining said



person in a generally upright, stable position; and first and second wheels each rotatably mounted to facing lateral portions of said frame for supporting said frame on said surface, wherein said wheels are positioned on said frame within the reach of said person to permit their rotation by said person in providing for the self-propelled locomotion of said person.

4,524,989

LAMINATED, REINFORCED FORK END FITMENT CONNECTOR FOR A BICYCLE AND PROCESS FOR MANUFACTURING SAME

Norman L. Centeny, Norridge, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Jul. 5, 1983, Ser. No. 510,632

Int. Cl.³ B62K *19/30, 25/02*

U.S. Cl. 280—281 R **4 Claims**

2. A laminated, reinforced fork end fitment connector for a bicycle comprising:

a base plate member formed from flat uniform thickness plate stock having at least one peripheral extension adapted to connect to a fork end of a bicycle and having an axle-engaging slot;

a pair of face plates formed from flat uniform thickness sheet stock and having slots matching the size and shape of the axle-engaging slot in the base plate member; and

said face plates being permanently affixed to opposite sides of the base plate member with the slots thereof registering with the axle-engaging slot in the base plate member;

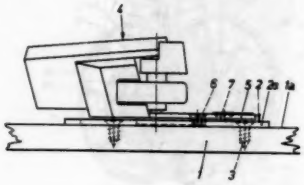
whereby said face plates provide thickened hub portions for the connector having opposite surfaces raised above the surfaces of the base plate member and assembleable to provide opposite seats for axle nuts in a bicycle axle assembly.

4,524,990

ADJUSTING MECHANISM

Josef Svoboda, Schwechat; Alois Himmetsberger, Vienna, and Emilie Szabo, Schwechat, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,631
Claims priority, application Austria, Nov. 14, 1980, 5624/80
Int. Cl.³ A63C *9/22*
U.S. Cl. 280—633 **13 Claims**



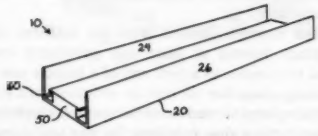
1. An adjusting mechanism for a jaw of a ski binding, comprising: a uniformly thick holding plate adapted to be fixed to an upper side of said ski, said holding plate being generally U-shaped and flat with an upwardly facing surface parallel to said upper side of said ski and having a pair of parallel legs with several pairs of laterally spaced first receiving openings therein and arranged in the direction of the longitudinal axis of the ski symmetrically in relationship to said axis, one of said pair of first receiving openings being provided in each leg and several of said receiving openings in each leg being equidistantly spaced from said longitudinal axis of said ski, a base plate on which is mounted said jaw, said base plate having at least two pairs of second receiving openings therein, the division between said second receiving openings in said base plate being offset in relationship to the division between said first receiving openings in said holding plate, means defining a dovetail guideway on the inside edges of each of said legs, a dovetail counterpart centrally disposed on said base plate slidingly received in said dovetail guideway, cooperating surfaces on said dovetail guideway and said dovetail counterpart preventing a separation of said counterpart from said guideway in a direction perpendicularly upward relative to said upper side of said ski, and pin means secured to said base plate and received in an aligned pair of said first and second receiving openings to hold said holding plate fixed to said base plate.

4,524,991

SNAP ON DEVICE FOR HARDCOVER RING BINDER

Ralph D. Thomas, 7104 Granada La., Fox Lake, Ill. 60020

Filed Jun. 27, 1983, Ser. No. 508,079
Int. Cl.³ B42D *1/00, 17/00, 3/06*
U.S. Cl. 281—20 **20 Claims**



1. A device to be removably attached to an openable side of a ring binder, said ring binder having two covers and a spine with a paperlock secured to said spine, said device having sufficient length to protect material contained within said ring binder and said device having sufficient width to render said covers substantially flat with said ring binder in a closed configuration to thereby simplify storing of said ring binder wherein:

a. said device includes a U-shaped support having a channel as an interior portion thereof;

b. a spacer means is secured within said channel to form a first binder cover channel and a second binder cover channel within said channel; and

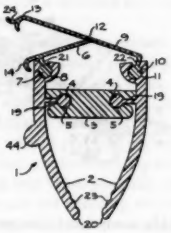
c. a flexible binder contact means is secured to said spacer means within said channel and is capable of flexibly contacting each cover of said binder and cooperating with said U-shaped support to render said ring binder flat in the closed configuration and protect said material in said binder.

4,524,992

BINDING UNIT

Maynard W. Linn, 6336 N. Bergeron, Fresno, Calif. 93704

Continuation-in-part of Ser. No. 362,021, Mar. 25, 1982,. This application Dec. 29, 1982, Ser. No. 454,320
Int. Cl.³ B42D *17/00, 5/00;* B42F *9/00;* A44B *21/00*
U.S. Cl. 281—45 **19 Claims**



2. A binding unit for loose-leaf sheet materials or the like, comprising a continuous section of resilient material having two legs, connecting means joining the legs near one end portion of one of the legs, and at the end portion of the other leg, the legs extending from the connecting means and each leg terminating in a free edge, the free edges having cooperating material engaging end portions, the connecting means including a spline disposed to provide pivotal movement to the one leg attached to the spline by hinge means at a point on the leg between the free edge of the leg and the end remote from the free edge, the spline being non-pivotally fixed to the end of the other leg, a keeper means mounted on the spline, a wedge that can be retained by the keeper, and means for closing the unit, the closing means including two clamping members being non-pivotally joined together, the end of the first clamping member being pivotally attached by hinge means to the end of the pivotal leg remote from the free edge and generally aligned in a plane parallel to the spline, the second clamping member having the wedge mounted on it disposed to be retained in the keeper, the second clamping member being shaped to engage the non-pivotal leg so that when the wedge is retained by the keeper, the end remote from the first clamping member provides a means to close said non-pivotal let and a fulcrum for pivoting said closing means to close said pivotal leg.

4,524,993

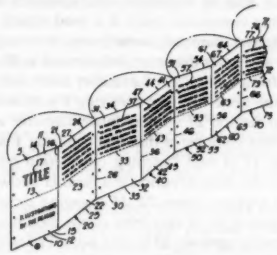
BOOK ASSEMBLY

Sherry Walker-Taylor, 2283 Bayswater Dr., Kennesaw, Ga. 30144

Filed Jun. 13, 1983, Ser. No. 503,416
Int. Cl.³ B42D *1/00, 15/00, 15/04*
U.S. Cl. 281—46 **5 Claims**

1. A book assembly comprising a plurality of rectangular sheets joined in accordian fashion, in succession along successive spaced parallel fold lines each fold line forming a common edge for the next adjacent of said sheets, the first common edge being a front edge and the next common edge being a rear edge and alternating front and rear edges thereafter, adjacent pairs

of said sheets being folded against each other so that a first side of the pair of sheets are adjacent to each other with the common edge between that pair of sheets forming a one of the front or rear edges whereby when the sheets are collapsed, the sides of the pairs of sheets form successive pages of the book, the trailing edge of sheets of the pairs of sheets being joined respectively to the leading edge of the sheets of the following pairs of sheets along rear edges, said sheets being provided with perfo-



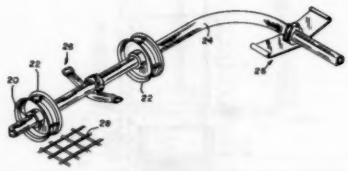
ration lines extending between the front edge and rear edge of each sheet for separating each sheet into an instruction area panel and a blank work sheet area panel, and printed indicia on said instructional area panel, the blank sheet area panels providing space for illustrations in seriatim and being removeable from the instructional area panels along said perforation lines after completion of the illustrations so that the work area panel may be separated from the instruction area panels to form a continuous display sheet of the work area panels in seriatim.

4,524,994

FLOWABLE CONCRETE DELIVERY HANDLING APPARATUS

William T. Anderson, P.O. Box 395, Dover Plains, N.Y. 12522

Filed Jul. 29, 1982, Ser. No. 402,936
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—38 **14 Claims**



1. A flowable concrete delivery apparatus including a high pressure conduit pipe of a selected length and diameter, having a discharge end said delivery apparatus including:

(a) a plurality of lengths of rigid pipe assembled in an end-to-end conduit relationship;

(b) at least one length of flexible pipe interposed and connected into said conduit so as to provide and enable said conduit to be bent at said flexible pipe length so that a discharge end may be moved to a selected and desired position; said lengths of pipe having their ends configured to accept a resilient gasket and with shoulder means for retaining of said ends in said assembled end-to-end relationship by a clamp and a clamp engaging said shoulder means and a gasket between said ends,

(c) a skid member affixed to a clamp which provides means as to allow the clamp to be opened and closed to secure and release the coupled pipe ends while said skid protects the the clamp and coupled ends of the pipe against dragging contact and wear on a support surface;

(d) a plurality of freely rotating wheels interposed on the pipe lengths, each wheel having an attached sleeve means which provides a free fit of the wheel on the outer diameter of a rigid pipe length, and

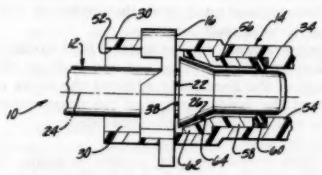
(e) manipulating means for locally moving said concrete delivery apparatus and pipe length portions thereof, said means including means for grasping by an attendant without accidental opening of said clamp or clamps during manipulation of the concrete delivery apparatus by and with said attendant's efforts to move the conduit pipe to a desired delivery position.

4,524,995

SWIVELABLE QUICK CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Division of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892.
This application Jul. 14, 1983, Ser. No. 513,847
Int. Cl.³ F16L *37/14*
U.S. Cl. 285—54 **30 Claims**



1. A connector assembly for providing a swivelable quick connection, comprising:

a tubular conduit adapted to convey fluid, having outwardly projecting annular surface means, formed at a predetermined distance from an end of said conduit to be connected, for providing a blocking wall portion disposed transversely to a central axis of said conduit;

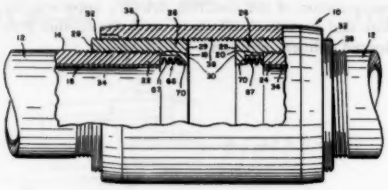
a housing having axial bore means formed therein for receiving said conduit at a first end and for providing a fluid path at a second end, said bore means forming an enlarged first diameter portion at said first end of said housing, and a reduced second diameter portion at said second end of said housing, elastomeric ring means disposed in said bore means for providing a seal between said conduit and said housing, and annular bushing means disposed in said bore means for positioning said ring means and for guiding the insertion of said conduit into a sealing engagement with said ring means; and

retainer means, demountably coupled to said first end of said housing, for cooperating with said blocking wall portion of said annular surface means to resist the disconnection of said conduit from said housing said retainer means having a pair of generally parallel elongated legs joined at one end by a cross member formed to provide a separation of said legs approximately equal to the outside diameter of said conduit, and said retainer means also having a lead area formed in the interior side of each of said legs which is sloped from the front surface of said retainer means in a direction towards the back surface of said retainer means, the thickness of said retainer means lead areas at the front surface being less than the thickness of said retainer means lead areas at the back surface.

4,524,996
CORROSION-RESISTANT TUBE ASSEMBLY

Joseph M. Hunt, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1982, Ser. No. 434,652
Int. Cl.³ F16L *9/14*
U.S. Cl. 285—55 **13 Claims**



1. In a corrosion-resistant tube assembly, a corrosion-resistant component comprising:

a corrosion-susceptible metal tube having an outside surface, an inside surface and end surfaces, and to be located adjacent another of said tube near their end surfaces;

an overlay sleeve of corrosion-resistant metal having a first and second portion, said first portion annularly extending about a surface of said tube and one surface of said sleeve adjacent the tube being mechanically joined to at least a portion of the tube surface, said first portion terminating in a second portion of the sleeve overlying the annular end surface of said tube, said sleeve other surface of said first portion disposed away from the surface of said tube and being threaded; and

a corrosion-resistant, tubular metallic liner having an outside surface, an inside surface and end surfaces, the outside surface of the liner being adjacent the entire circumference of the inside surface of the corrosion-susceptible metal tube along its longitudinal extent;

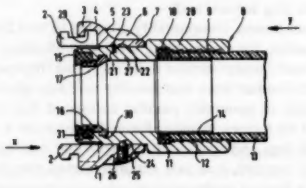
the improvement comprising:

a corrosion-resistant annular expansion-sealing ring annularly fixed to the end surface of the liner and positioned at a location at the end surface of the corrosion-susceptible tube and between the liner and inside surface of the second portion of the sleeve and bearing thereagainst to seal the corrosion-susceptible metal tube about the circumference thereof from any corrosives in the tube assembly and to provide an expansion joint between the liner and tube.

4,524,997
HOSE COUPLING

Karl Ebert, Giengen, Fed. Rep. of Germany, assignor to Max Widenmann Armaturenfabrik, Giengen, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,873
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 8307717[U]
Int. Cl.³ F16L *33/20*
U.S. Cl. 285—74 **7 Claims**

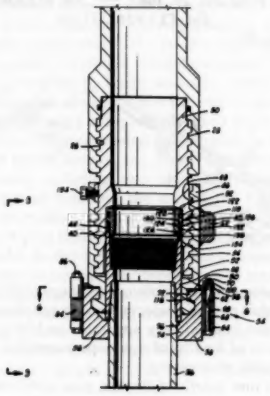


1. Hose coupling, particularly for fire extinguishing hoses, whose halves have cam rings which are rotatable relative to hose connection pieces assigned to each said half and whose cams can be made to engage in a bayonet-type locking engagement with an annular groove of said cam ring of the other respective said coupling half, said annular groove being sloped, whereupon the turning of said cam rings causes said hose connection pieces to draw together axially so that sealing rings arranged in their end faces are pressed against one another axially without reciprocal turning and in which said hose connection pieces are adjusted for inner fastening, for which purpose an expandable clamping ring is provided, which holds said hose in contact with the inner wall of the fastening connection piece after its expansion, characterized in that a one-piece fastening connection piece **8** is used which has two sections of different diameter, namely one rear section **28** of a larger inner and outer diameter, which section **28** receives said hose, and a front section **27** of a smaller inner and outer diameter; in that the neck **7** of said cam ring **1** is rotatably attached on said front section **27** with an inner diameter which is constant along said sections; in that said cam ring **1** is held on said front section **27** of said fastening connection piece **8** against movement in the axial direction in a manner allowing it to turn by means of locking means **22**; **24** engaging simultaneously in an annular groove **21** of said front connection piece section **27** and in an annular groove **23** in said neck **7** of said cam ring **1**, which locking means **23**; **24** are employed as particular structural component parts; and in that a springing holding ring **16** catches in an annular groove **30** of said front section **27** of said fastening connection piece **8**, which holding ring **16**, together with a recess **31** on the end face in said front section **27**, forms a shaped annular space for receiving the sealing ring **15** of said coupling on said end face.

4,524,998
TUBULAR CONNECTING DEVICE

David P. Brisco, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 4, 1982, Ser. No. 374,869
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—101 **3 Claims**



1. A coupling apparatus for connection to a cylindrical member, comprising:

a body having a cylindrical bore disposed in a lower end thereof and having a radially outer threaded surface, said bore having an inner diameter appropriate to closely receive an end of said cylindrical member therein;

main seal means disposed in said bore of said body for sealing against an annular upward facing surface of said end of said cylindrical member;

a cylindrical adjusting nut having an internally threaded upper end threadedly engaged with said outer threaded

surface of said body, and having an annular groove disposed in a radially outer surface thereof; and

a locking collar, including

a first arcuate collar portion having an upper lip received in said annular groove, and having a lower lip adapted to engage a downward facing annular surface of an enlarged diameter portion of said cylindrical member;

an second arcuate collar portion having an upper lip received in said annular groove, and having a lower lip adapted to engage said downward facing annular surface of said enlarged diameter portion of said cylindrical member;

a hinge pin, disposed through pin receiving holes in said first and second collar portions, so that said first and second collar portions are pivotally connected;

a limit plate concentrically disposed about said adjusting nut and having an orientation hole therethrough through which said hinge pin is disposed, said limit plate including means for limiting relative pivotal opening movement of said first and second collar portions; and

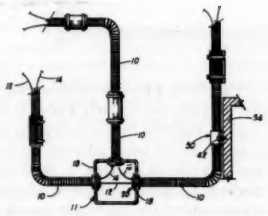
latch means for selectably latching said first and second collar portions in an open position wherein said enlarged diameter portion of said cylindrical member can be passed through said locking collar into said bore of said body, and a closed position wherein said enlarged diameter portion of said cylindrical member is locked within said bore of said body.

4,524,999

FLEXIBLE CONDUIT SYSTEM

Harold T. Pate, Cleveland, and Helmut P. Fochler, Chagrin Falls, both of Ohio, assignors to Indian Head Inc., New York, N.Y.

Division of Ser. No. 875,229, Feb. 6, 1978, Pat. No. 4,248,459.
This application Sep. 24, 1979, Ser. No. 78,376
Int. Cl.[3] F16L *41/00*
U.S. Cl. 285—158 **1 Claim**



1. A system for supporting and conveying electrical conductors comprising:

a synthetic resin electrical box having a side wall defining a conduit-receiving opening communicating with the interior of said box;

a pair of elongated, synthetic resin tubular corrugated conduits having external annular corrugations extending therearound;

an inlet fitting within said conduit-receiving opening and engaged with the opening-defining side wall of said synthetic resin box, said inlet fitting engaging one of said elongated, synthetic resin tubular corrugated conduits by mechanical registry of said inlet fitting with the corrugations of said one tubular corrugated conduit;

a synthetic resin sleeve clampingly engaging said conduits in end-to-end relation and including:

a pair of elongated, axially extending, radially movable corrugated clamping elements movable relative to each other for closure about the tubular corrugated conduits, each of said clamping elements comprising a semi-cylindrical part having a series of semi-circular, arcuate, axially spaced corrugations over a major portion of its length and configured to register with the corrugations of the tubular corrugated conduits clampingly engaged by said resin sleeve;

flexible hinge means hingedly interconnecting said semi-cylindrical parts along a longitudinal edge of each, said hinge means comprising:

a flexible, medial hinge section joining said semi-cylindrical parts at locations intermediate the length thereof; and

a pair of end hinge sections each spaced axially from said medial hinge section; and

means releasably converging said clamping elements to retain said clamping elements in a closed position in engagement with said conduits, with the corrugations of said clamping elements engaged with the corrugations of said conduits, said means releasably converging said clamping elements comprising:

first elongated strap means surrounding said semi-cylindrical parts and passing through the space between one of said end hinge sections and said medial hinge section, said first elongated strap means comprising:

an elongated first strap having a tooth-carrying end portion carrying a series of teeth spaced from each other thereon; and

a first engaging block secured to the opposite end of said first strap from said tooth-carrying end portion thereof, said first engaging block having a slot therein to receive the tooth-carrying end portion of said first strap, said first engaging block being serially and selectively engagable with the teeth on said first strap to facilitate extension of said strap around said semi-cylindrical parts when said parts surround synthetic resin tubular corrugated conduits of varying diametric sizes, and to prevent reverse movement of said first strap out of said slot after said first strap has been extended through said slot; and

second elongated strap means surrounding said semi-cylindrical parts and passing through the space between the other of said end hinge sections and said medial hinge section, said second elongated strap means comprising:

an elongated second strap having a tooth-carrying end portion having a series of teeth spaced from each other thereon; and

a second engaging block secured to the opposite end of said second strap from said tooth-carrying end portion thereof, said second engaging block having a slot therein to receive the tooth-carrying end portion of said second strap, said second engaging block being serially and selectively engagable with the teeth of said second strap to permit said elongaged second strap to be encircled around said synthetic resin sleeve when said sleeve is clampingly engaged with varying diametric sizes of conduit and to prevent reverse movement of the second strap out of said second block slot after said second strap has been extended through said second block slot.

4,525,000

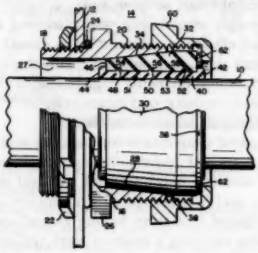
CABLE FITTING WITH VARIABLE INNER DIAMETER GROMMET ASSEMBLY

Walter W. Bachle, Harwinton, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,145
Int. Cl.[3] H02G *3/18*
U.S. Cl. 285—177 **14 Claims**

1. A cable fitting having an externally threaded tubular body through which the cable extends, said body having an inside surface a portion of which is tapered in shape, a grommet assembly in said body, and a nut threaded on one end of said

body also having an opening through which said cable extends for compressing said grommet assembly to secure the cable within the fitting, characterized in that said grommet assembly has a grommet with a conical outside surface which is tapered in a direction opposite to said tapered portion of said inside surface of said body so that said grommet is compressed both radially and axially by said nut, said grommet being of compressible elastomeric material with an insert also of compressible elastomeric material separate from said grommet and



removably disposed therein for decreasing the inside cross section of said grommet assembly, whereby said grommet and said insert cover a range of cable cross sections larger than said grommet alone, said insert and said grommet being in such interlocking relationship as to limit axial movement of said insert during compressing of said grommet assembly and when said cable is pulled against the fittings, said interlocking being sufficient to prevent the insert from popping and pulling out of said grommet.

4,525,001

PIPE CONNECTOR WITH INTERENGAGABLE TUBULAR PIN AND TUBULAR BOX MEMBERS

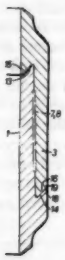
Norman Lumsden, and Brian K. Phillips, both of Aberdeen, Scotland, assignors to Hunting Oilfield Services (UK) Limited, Aberdeen, Scotland

Filed Jan. 14, 1983, Ser. No. 458,154

Claims priority, application United Kingdom, Jan. 18, 1982, 8201250

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—328 **6 Claims**



1. In a pipe connector comprising a tubular pin member having a generally frusto-conical outer peripheral surface, a tubular box member having a generally frusto-conical inner peripheral surface corresponding to said outer peripheral surface of said pin member and which overlies said outer peripheral surface of said pin member when said members are fully engaged together, said peripheral surfaces being provided with annular projections and grooves which interengage when said members are fully engaged together to axially lock said members together, and means for supplying fluid under pressure between said peripheral surfaces when said members are fully engaged together for use in disengaging said members, the improvement wherein at least one of said pin member and said box member has a free end surface which includes an annular portion inclined in the opposite direction to the direction of inclination of said peripheral surface thereof, and the other one of said box member and said pin member is provided with a correspondingly inclined annular surface which, when said members are fully engaged together, overlies and is closely spaced from said corresponding surface on said pin member of box member, said surfaces, when said members are fully engaged together, being intentionally brought into sealing contact only when pressurized fluid is applied between said peripheral surfaces of said members for use in disengaging said members.

4,525,002

DEVICE FOR APPLYING A BINDING ON A FLEXIBLE TUBULAR PACKING, AND IMPROVED BINDING THEREFOR

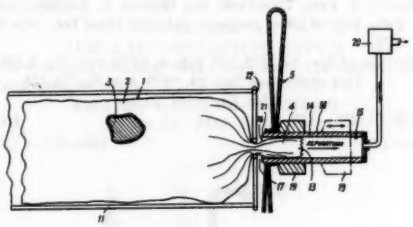
Jean-Frédéric Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, France

Filed Mar. 9, 1982, Ser. No. 356,470

Claims priority, application France, Mar. 10, 1981, 81 04714

Int. Cl.³ A01D *59/04;* **B65H** *69/04*

U.S. Cl. 289—2 **6 Claims**



1. A device for applying a knot-shaped binding on the end of a flexible tubular packing, particularly a pork-butchery article, comprising a hollow mandrel for receiving the narrowed end of the packing, said mandrel being adapted for receiving on its cylindrical outer peripheral surface a previously prepared knot-shaped binding; a sliding push-piece adapted for sliding the binding on the mandrel for ejecting it therefrom and transferring it onto the narrowed end portion of the packing protruding from the mandrel; and suction means for the narrowed free end through the mandrel in order to stretch it axially during the application of the knot.

4,525,003

KNOTTING DEVICE

John L. Tate, Jr., Rte. 8, Box 464, Denham Springs, La. 70726

Filed Jan. 26, 1984, Ser. No. 574,058

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—17 **20 Claims**

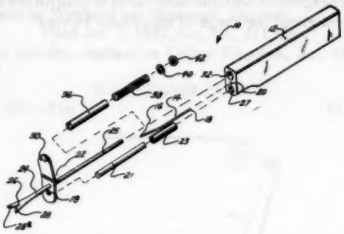
1. A knotting device which comprises:

(a) a handle portion;

(b) an elongated resiliently flexible rod attached at its proximate end to said handle portion, said rod having a taper to at least a near-point at its distal end; and

(c) an elongated member movably mounted to said handle portion whereby the distal end of said elongated member

travels along a path which extends from a point rearward of to a point forward of said distal end of said rod, said distal end of said elongated member having a forked portion which includes a knot recess at its crotch.

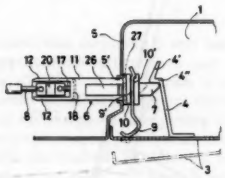


4,525,004

LID LOCK STRUCTURE

Toshie Tanaka, Tokyo, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Feb. 11, 1983, Ser. No. 465,842
Claims priority, application Japan, Feb. 19, 1982, 57-21399[U]
Int. Cl.³ E05C *1/12*
U.S. Cl. 292—171 **4 Claims**



1. A lid lock structure for a hinged lid in combination with an outwardly opening walled recess in a car body including a catch leg having a ramp and step portion at its free end forming a shoulder facing in spaced relation to and fixed to the back of the hinged lid, and a latch assembly, which comprises: a hollow housing fixed at its head to one apertured side wall of the recess; a bolt having a cam end contained in the hollow housing and integrally spring-loaded to partly project said cam end from the front surface of the housing into the recess, thus catching the shoulder portion of the catch leg when the lid is closed; and a plate spring connected to the head of the housing, yieldingly bent to constantly apply pressure against the lid when the lid is closed, whereby the lid is snapped opened from the interior when unlatched by retracting the spring bolt from engagement with said shoulder portion of said catch leg.

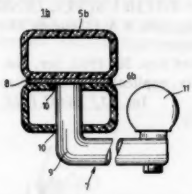
4,525,005

BUMPER COMPONENT MADE OF FIBER-REINFORCED MATERIAL FOR AUTOMOBILES OR THE LIKE

Wolfgang Prochaska, Munich, and Ralf-Thilo Schulz, Putzbrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 536,170
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237762
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—117 **11 Claims**

1. A fiber-reinforced vehicle bumper bar having a central longitudinal axis, comprising at least two wound bodies of fiber-reinforced synthetic resin impregnated material windings, each of said wound bodies having a box-shaped completely closed substantially rectangular cross-sectional configuration, said fiber-reinforced synthetic resin impregnated material windings having a fiber orientation relative to said longitudinal axis selected in accordance with strength requirements of the bumper bar along its length, said substantially rectangular configuration having two shorter and two longer walls with two longer walls of said two bodies bonded together along the entire length of said bumper bar, said two longer walls which are bonded together forming a central double wall extending substantially horizontally in a use position of said bumper bar for an increased bonding strength.

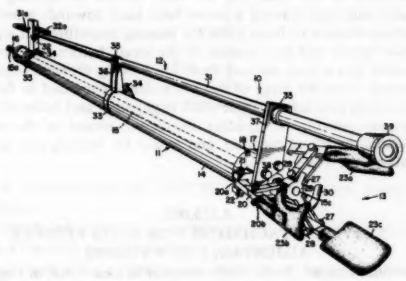


4,525,006

ELECTRICAL DISCONNECT TOOL

David J. Nowak, Saint Paul, and David F. Zupfer, Stillwater, both of Minn., assignors to R.J. LeVesque Manufacturing Co., St. Paul, Minn.

Filed May 2, 1983, Ser. No. 490,799
Int. Cl.³ A47F *13/06*
U.S. Cl. 294—19.1 **11 Claims**



1. An electrical disconnect tool for insulatably gripping and removing a high voltage termination from a connector, the terminator having a removal hook, said tool comprising:

(a) an elongated tube having first and second ends;

(b) a working head cooperatively connected to said second end of said elongate tube, said working head comprising a plurality of opposed jaw members for gripping the terminator;

(c) means for moving said working head between open and closed positions;

(d) a ratchet assembly axially spaced from and cooperatively connected to said tube, said ratchet asembly having a ratchet rod with first and second ends, said second end being axially spaced from said working head, whereby operation of said ratchet assembly causes said working head to be moved gradually away from said second end of said ratchet rod; and

(e) means for engaging the removal hook of the terminator, said engaging means cooperatively connected to said working head and said ratchet assembly is aligned with said engaging means, whereby when said engaging means engages the removal hook of the terminator, said second

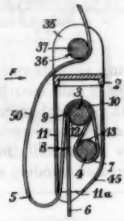
end of said ratchet rod is in a general vertical relationship to the terminator.

4,525,007

DEVICE FOR LOCKING STRAPS AT THE TIME OF LIFTING LOADS, WITH POSSIBLE ADJUSTMENT OF THEIR USEFUL LENGTH

Jean-Pierre Chapalain, 8 À 18, rue de Méry, 95310 Saint Ouen l'Aumone, France

Filed Sep. 20, 1982, Ser. No. 419,910
Claims priority, application France, Sep. 7, 1982, 82 15159
Int. Cl.³ B66C *1/18*
U.S. Cl. 294—74 **9 Claims**



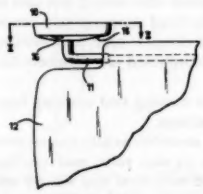
1. A device for locking a strap for lifting loads and securing it to a lifting member, comprising: a yoke shaped piece having arms pierced with two pairs of holes in facing relation, a removable case having sides pierced with two pairs of holes which come into alignment with said holes of the yoke when the case is housed in the yoke, two parallel shafts engaged in the holes of the yoke and the case, means for locking said shafts, said case having a cover bent back towards a bottom portion thereof to form a slit for passing therethrough superposed active and free strands of the strap, before the same is wound into a loop on said shaft for locking thereof, lugs extending from the arms of the yoke, holes provided in facing relation in said lugs, a guide shaft engaged in said holes of said lugs and serving for guiding the active strand of the strap towards the lifting member, and means for locking said guide shaft on the yoke.

4,525,008

SWIVEL ATTACHMENT FOR AUTO VEHICLE ADJUSTABLE SUN VISORS

Giovanni Foggini, Turin, Italy, assignor to Lear S.n.c. di Foggini & C., Orbassano, Italy

Filed Mar. 28, 1983, Ser. No. 479,538
Claims priority, application Italy, Apr. 9, 1982, 67475 A/82
Int. Cl.³ B60J *3/02*
U.S. Cl. 296—97 K **10 Claims**



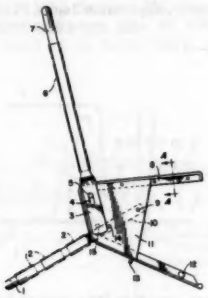
1. A swivel attachment for automobile vehicle adjustable sun visors, including a suspension rod having an end, comprising a supporting body of a polymeric material having a throughgoing socket holding, with allowance for rotation, an end of said visor suspension rod, defining a cranked projection, in spaced relationship within two opposing cheeks formed within said body, and having an inside hollow space extending through an arc at least as wide as the adjustable angle of said visor suspension rod, said two opposing cheeks of said supporting body being engaged by said cranked projection and acting in elastic contact engagement with the same, so as to control the angular travel throughout the range of movement thereof.

4,525,009

CHAIR CHANGEABLE INTO EASY CHAIR

Alejandro de la Sota Martinez, Avenida de América No. 49, Madrid-2, Spain

Filed Jan. 26, 1983, Ser. No. 461,973
Claims priority, application Spain, Jan. 29, 1982, 262.857[U]
Int. Cl.³ A47C *13/00*
U.S. Cl. 297—118 **8 Claims**



1. An article of furniture which is convertible between first and second positions of use as a chair and as a lounge, respectively, said article of furniture comprising:

a base structure including two generally U-shaped frameworks each having first and second legs, said two frameworks being connected together in spaced parallel planes by a rod connecting said first legs and by a rigid panel extending between and connecting said second legs, said base structure being movable between said first position of use, whereat said rigid panel is a seat of said chair and said first legs form one support of said chair, and said second position of use, whereat said first and second legs form two supports of said lounge;

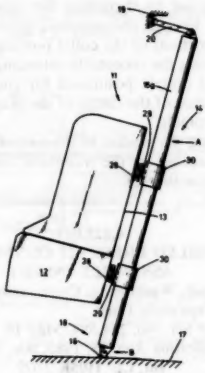
a first U-shaped frame having arms pivotally mounted to respective said frameworks about a first axis of rotation, said first frame being rotatable about said first axis between a first position, whereat said first frame forms another support of said chair when said base structure is in said first position of use, and a second position, whereat said first frame forms a seat of said lounge when said base structure is in said second position of use; and

a second U-shaped frame having arms pivotally mounted to respective said frameworks about a second axis of rotation, said second frame being movable with respect to said second axis between a first position, whereat said second frame forms a backrest of said chair when said base structure is in said first position of use, and a second position, whereat said second frame forms a backrest of said lounge when said base structure is in said second position of use.

4,525,010
AIRCRAFT SEAT

Peter W. Trickey, Sherborne; David C. Netherway, Sturminster Newton, and William S. Clifford, Martock, all of England, assignors to Westland plc, Somerset, England

Filed Jul. 7, 1983, Ser. No. 511,586
Claims priority, application United Kingdom, Jul. 19, 1982, 8221028
Int. Cl.³ B60R 21/10
U.S. Cl. 297—216 10 Claims

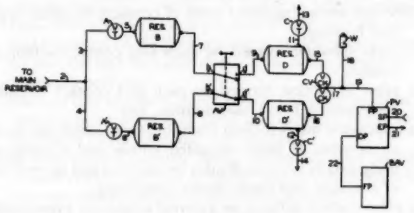


1. An aircraft seat including a seat bucket and a back-rest portion, support means attached to said back-rest portion to permit generally vertical movements of the seat, and energy absorber means adapted to support the seat in an operative position, seat support means comprising an articulated support structure adapted to react to vertical, longitudinal and lateral loads, the articulated structure including two parallel generally vertical guide tubes supported at each end by pivoted attachments to aircraft structure.

4,525,011
VIGILANCE SAFETY CONTROL SYSTEM

Richard L. Wilson, Monroeville, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Sep. 20, 1982, Ser. No. 420,197
Int. Cl.³ B60T 7/14
U.S. Cl. 303—19 8 Claims

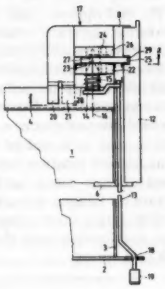


1. A safety control system for checking the alertness of an operator of a moving vehicle comprising, first and second parallel fluid circuits each having separate first and second reservoirs, an input choke valve is disposed in line with said first reservoir of each circuit to restrict the rate of fluid flow to said first reservoirs and an output choke valve is cooperatively associated with said second reservoir of each circuit to bleed off the pressure in said second reservoirs wherein the fluid flow rate of said input choke valves and the pressure bled off by said output choke valves establish a predetermined cycle time for initiating a warning signal, a reversing valve cooperatively associated with said first and second reservoirs of each circuit for selectively and alternately interconnecting said first reservoir to said second reservoir of each circuit, and means including a pilot valve which directly receives fluid pressure from said second reservoir in each circuit for causing a penalty brake application when the operator fails to acknowledge the warning signal by switching said reversing valve within a predetermined time after the warning signal is initiated.

4,525,012
LOCKING APPARATUS FOR DRAWERS AND THE LIKE

Max Dünner, Erlen, Switzerland, assignor to Lista AG, Switzerland

Filed May 3, 1983, Ser. No. 491,288
Claims priority, application Switzerland, May 12, 1982, 2966/82
Int. Cl.³ A47B 88/04
U.S. Cl. 312—222 17 Claims



10. A pull-out member, such as a drawer or rack board, comprising:

mounting and guiding means including a bearing rail located in a running rail attached to a housing;

a locking member including a pivotable lever having a guide opening therethrough;

means defining a recess in the housing to receive said locking member;

support means, adjacent the back of said pull-out member, for movably supporting said locking member on said pull-out member for movement relative to said pull-out member in a direction perpendicular to the direction of pull-out member movement between a first position in said recess and a second position out of said recess, said support means including a pivot fixedly attached to the rear of said pull-out member;

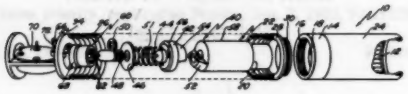
operating rod means longitudinally movable for operating said locking member between said first and second positions, said operating rod means including an axially moveable ram member having a cam surface inclined relative to the movement axis thereof, said cam surface being positioned adjacent an edge of said guide opening such that axial movement of said rod means and said ram member relative to said lever moves said lever between said second and first positions, said ram member including a cylindrical pin, said cam surface being conical and located at the distal end of said cylindrical pin; and

guide means for supporting and guiding said rod means along a side of and beyond a front of said pull-out member.

4,525,013
DEMOUNTABLE COAXIAL ELECTRICAL CONNECTOR FOR IN-LINE AMPLIFIERS

Raymond J. Phillips, Oakdale, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1984, Ser. No. 571,414
Int. Cl.³ H01R *39/00*
U.S. Cl. 339—7 **2 Claims**

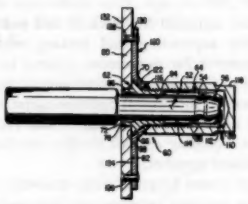


1. A flexible electrical connector comprising:
a first assembly including a first contact piece adapted to be demountably connected, said first assembly further includes a spring seat having an aperture in which the first contact piece is press fitted and a retaining ring positioning said first contact piece within said spring seat aperture;
a second assembly including an insulated second contact piece adapted to be demountably connected, said second contact piece having a split end and an electrical feedthrough with the end opposite said split end adapted for receiving an external electrical conductor; and
flexible means for providing an electrical conductive bending radius between said first and second contact pieces, said flexible means further including an electrical wire connected between said first contact piece and said split end of said second contact piece, a spring cap having a split end abutting said split end of said second contact piece to prevent relative rotation between said spring cap and said second contact piece, said spring cap further having an aperture for passing therethrough said electrical wire and a flexible spring connecting said spring cap and said spring seat and having said electrical wire passing axially through said spring.

4,525,014
AIRCRAFT GROUNDING RECEPTACLE

Howard E. Holman, and Roy D. Turner, both of Fort Worth, Tex., assignors to T. J. Electronics, Arlington, Tex.

Continuation-in-part of Ser. No. 466,915, Feb. 16, 1983,. This application Jan. 10, 1984, Ser. No. 569,603
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **6 Claims**

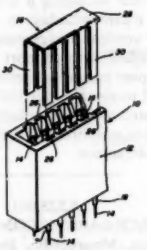


1. An aircraft grounding receptacle comprising:
a unitary body of electrically conductive material;
said body of electrically conductive material including a plug receiving portion and a collet portion;
the plug receiving portion including a flange characterized by a first surface extending perpendicularly to the axis of the receptacle and adapted for engagement with the internal surface of an aircraft panel and a second surface sloping inwardly toward the collet portion;
said plug receiving portion further including an extension projecting from the flange in the opposite direction from the collet portion and adapted to project through an aperture in the aircraft panel;
the collet portion having reduced diameter portions adapted to matingly receive the terminal groove and the tip of an aircraft grounding plug therein;
said collet portion further comprising a plurality of longitudinally extending slots defining a plurality of tines therebetween adapted to flex outwardly when an aircraft grounding plug is inserted into the collet portion of the receptacle and to thereafter flex inwardly to securely retain the tip and the terminal groove in the reduced diameter portions of the collet portion;
a washer having the receptacle extending therethrough and including a dimple positioned for engagement with the second surface of the flange of the plug receiving portion of the receptacle;
means securing the washer to the aircraft panel; and
a housing mounted on the receptacle and surrounding the collet portion thereof.

4,525,015
PREASSEMBLED PRESS FIT CONNECTOR WITH ASSEMBLY INSERT

Gary W. Schwindt, Washington, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Continuation of Ser. No. 264,584, May 18, 1981, abandoned. This application Aug. 25, 1983, Ser. No. 526,308
Int. Cl.³ H05K *1/00*
U.S. Cl. 339—17 C **3 Claims**



1. A preassembled press fit connector for mounting on a printed circuit board in an array of plated thru holes comprising:
a selectively configured connector housing,
first and second adjacent rows of contacts mounted within said housing,
a press shoulder formed on each said contact within said housing,
a press fit section formed on each said contact extending downwardly below said housing, and
a removable insert formed from thin sheet stock and having an inverted U shape mounted within said housing and being axially supported soley by said first and second rows of contacts, said insert means comprising:
a plate portion defining an external connector press surface above said housing, and
first and second rows of integral teeth extending downwardly from said plate portion and engaging one each with said press shoulders of said first and second rows of contacts, whereby a force applied to the external press surface of the insert is transfered by said first and second rows of integral teeth and whereby the press fit sections of a plurality of press fit connectors may be simultaneously forced into mating engagement with the plated thru holes of the printed circuit board by applying pressure with the flat pressing surface of a press head to the external connector press surfaces presented by the removable inserts in

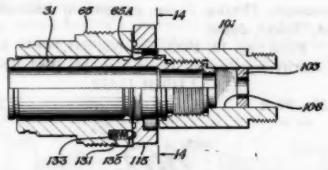
said plurality of preassembled press fit connectors, said press head being withdrawn from said connector independently of said removable insert whereby the press head must be withdrawn from said removable insert prior to said removable insert being removed from said connector.

4,525,016

LOCKING APPARATUS FOR TEST PROBE

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Feb. 21, 1984, Ser. No. 581,610
Int. Cl.³ H01R *13/631*
U.S. Cl. 339—75 R **4 Claims**



1. Locking apparatus for a test probe of the type having electrical contact means at its forward end, a central body member, a movable sleeve located around said central body member, said movable sleeve being movable axially to forward and rearward positions relative to said central body member to cause latch means to be moved to latching and unlatching positions respectively relative to said central body member, comprising:

structural means coupled to said central body member rearward of said movable sleeve at a position such that the forward end of said structural means is spaced from the rear end of said movable sleeve when it is in its forward position,

a ring shaped member located around said central body member,

coupling means for coupling said ring shaped member to the rear end of said movable sleeve such that said ring shaped member will move axially with said movable sleeve when said movable sleeve is moved to its forward and rearward positions,

said coupling means allowing said ring shaped member to be moved to locking and unlocking positions in directions transverse to the axis of said central body member,

said ring shaped member being movable to its locking position when said movable sleeve is in its forward position thereby locating a portion of said ring shaped member between a portion of said rear end of said movable sleeve and a portion of the forward end of said structural means to prevent said movable sleeve from being moved to its rearward position,

when said ring shaped member is in its unlocked position, its opening being located to allow said movable sleeve to be moved to its forward and rear positions,

said ring shaped member being located at least partially around the forward end of said structural means when said movable sleeve is located at its rear position.

4,525,017

ANTI-DECOUPLING MECHANISM FOR AN ELECTRICAL CONNECTOR ASSEMBLY

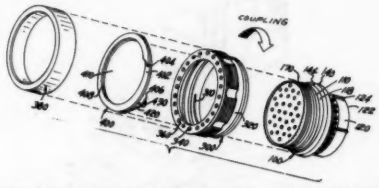
Alan L. Schildkraut, Sidney, and Robert W. Brush, Sr., Unadilla, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1983, Ser. No. 493,535
Int. Cl.³ H01R *13/623*
U.S. Cl. 339—89 M **11 Claims**

1. An anti-decoupling mechanism for a separable electrical connector assembly, the connector assembly including first and second connector members adapted for mating engagement and a coupling member rotatably mounted to one of said connector members for drawing the connector members into mating engagement, said one connector member including a forwardly facing rear end wall and an annular wall circumferentially therearound, said coupling member comprising a radial flange having an outer end wall, said anti-decoupling mechanism resisting rotation of the coupling member in both coupling and uncoupling directions and characterized by:

a plurality of detents disposed around said outer end wall; and

a radially expansible and contractible spiral band interference fit about said annular wall and adapted for movement between first and second positions depending, respectively, on whether the coupling member is rotated in said



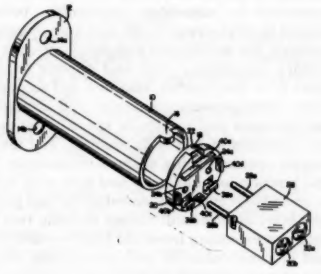
coupling and uncoupling directions, said spiral band abutting said rear end wall and including a laterally deflectable arm adapted to successively engage the detents driven thereagainst during rotation of the coupling member with movement of said spiral band to the first position causing the spiral band to radially expand from its interference fit and slide relative to annular wall and to the second position causing the spiral band to radially contract and the arm to laterally deflect from the detent, the radial contraction increasing frictional forces acting between the spiral band and the annular wall to prevent rotation therebetween until sufficient torque is applied to laterally deflect the arm from the detent whereby to allow the coupling member to rotate and the arm to advance into engagement with the next successive detent.

4,525,018

MODULAR TERMINAL HOUSING

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Jun. 15, 1984, Ser. No. 621,112
Int. Cl.³ H01R *13/502*
U.S. Cl. 339—91 R **4 Claims**



1. A modular housing and terminal for an electrical component comprising:

(a) a terminal strip having a substantially rectangular base;

(b) a substantially cylindrical housing for an electrical component; and

(c) adapter means for connecting said terminal strip to said

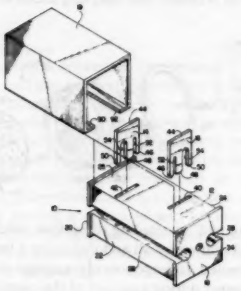
housing, said means having two sides, one side including rectangular retaining means for engaging said terminal strip, and the other side including arcuate retaining means for engaging said housing.

4,525,019

SELF-STRIPPING CONNECTOR FOR INSULATED WIRES

Joseph L. Brasky, 15 Tower Hill Rd., Killingworth, Conn. 06417

Continuation of Ser. No. 351,642, Feb. 23, 1982, abandoned.
This application May 11, 1984, Ser. No. 609,490
Int. Cl.³ H01R *9/08*
U.S. Cl. 339—98 **1 Claim**



1. In an electrical radiant heating panel assembly for connection in parallel to a pair of insulated power wires of opposite polarity and which extend in a closely spaced parallel relationship with each other, the combination comprising:

(a) a radiant heating panel including an electrical resistance heating wire having a major portion extending in the body of the panel and two insulated lead end portion protruding from one edge of the panel for connection in parallel to the pair of insulated power wires of opposite polarity,

a connector including

(a) an insulative body member in the form of a generally rectangular block having opposite sides and a top, said body member defining a pair of elongated through channels extending between said opposite ends and arranged on opposite sides of the member, each channel opening outwardly and having a narrow neck portion and a wider interior portion so as to receive and securely retain an insulated power wire urged sideways in a snap action and in a lateral direction into said interior portion of the channel, said body member thus being supported in suspended relationship between said spaced parallel power wires, said body member further defining first and second elongated openings extending toward one another from said opposte ends but insulated form one another, said first and second openings being approximately concentric and arranged end-to-end between and in closely spaced relationship with said channels in said body member, and said first and second openings being adapted respectively to receive and position longitudinally said lead wire end portions in an endwise entry movement of the end portions, and said body member still further defining two thin slots, each slot extending from said body member top surface and in communication with one of said channels and one of said openings,

(b) two thin flat resilient conductive contact elements each having a head portion and spaced wire-receiving slots defined by fingers extending opposite the head portion, each of said contact elements being of such size and shape as to be slidably received within a separate one of said thin body member slots, and said fingers of each contact element adapted to engage the conductors of isulated wire positioned within the channel and opening communicating with its slot to form electrical contact between the conductors, and

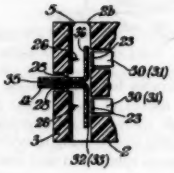
(c) a cover fastenable over the insulative body member for covering the head portions of the contact elements and securing the same in fully inserted condition within their respective slots, said cover also extending over said narrow neck portion of each of said channels and thus positively retaining said power wires against accidental lateral dislodgement from their respective channels.

4,525,020

ELECTRICAL CONNECTOR

Hiromi Yasumoto, Hitaka, Japan, assignor to Junkosha Company Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,747
Claims priority, application Japan, Sep. 21, 1982, 57-143139
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—99 R **3 Claims**



1. A connector for a flat cable having alternating pairs of conductors, the connector having an insulating first housing in which a plurality of ready access terminals are fitted to female or male receptacles,

an insulating second housing affixed to said first housing, characterized in that said ready access terminals have conductor contact faces which are arranged in two parallel rows, and, in addition, provided on the rear side of said first housing to which said cable is connected are a plurality of conductors of said cable which are exposed and in which the conductors in each pair of conductors are directed away one from the other, the conductors being put into contact with the conductor contact faces of said ready access terminals, said cable conductors being compressed and contacting said conductor faces simultaneously with the affixing of said second housing onto said first housing, and wherein a plurality of pins are provided on said second housing at positions corresponding to said conductor contact faces, and said cable conductors are compressed and contacting said conductor contact faces through said pins.

4,525,021

ELECTRICAL CABLE CONNECTOR ASSEMBLY

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Oct. 24, 1983, Ser. No. 544,709
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—104 **4 Claims**

1. An electrical cable connector assembly, comprising:

an electrical connector,

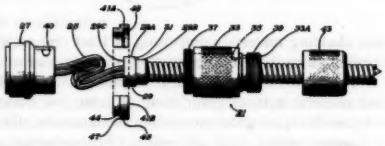
a hollow armored cable means,

a fitting having an opening formed therethrough connected to an end of said armored cable means,

said fitting having an enlarged forward end and a rear end with a shoulder formed therebetween facing the rear of said fitting,

electrical lead means extending through said armored cable means and through said fitting and coupled to said connector,

a body having an opening formed therethrough,
said body having a forward end adapted to be removably coupled to said connector and a rear end to be located near and forward of said forward end of said fitting when said forward end of said body is coupled to said connector,
said electrical lead means extending through said opening of said body when said forward end of said body is coupled to said connector,
said opening of said body being large enough such that said body may be moved rearward of said fitting when said forward end of said body is uncoupled from said connector,
ring means having a forward end and an enlarged rear end with a shoulder formed therebetween facing said forward end of said ring means,
said ring means having a rearward facing portion,
said ring means being adapted to be located around said electrical lead means with its forward end located within



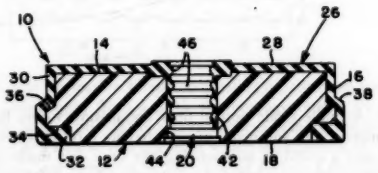
said opening of said body such that said rear end of said body engages said shoulder of said ring means and with said rearward facing portion of said ring means engaging said forward end of said fitting,
a nut means having an opening formed therethrough,
said nut means being located around said armored cable means and adapted to be removably coupled to the rear end of said body,
said nut means having structure adapted to engage said shoulder of said fitting when said nut means is coupled to the rear end of said body and said forward end of said body is coupled to said connector whereby said fitting will be securely held between said ring means and said structure of said nut means,
said nut means being adapted to be uncoupled from said body and moved rearward thereby allowing said ring means to be removed,
said ring means being characterized such that it may be removed transversely from said electrical lead means.

4,525,022

ELECTROLYTIC CAPACITOR AND IMPROVED HEADER THEREFOR

Myles N. Murray, 15 Skyline Dr., Chagrin Falls, Ohio 44022

Filed Jun. 30, 1983, Ser. No. 509,248
Int. Cl.³ H01R *9/16*; H01G *9/00*
U.S. Cl. 339—220 C **16 Claims**



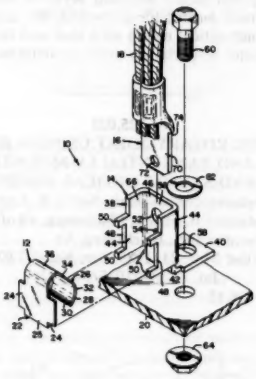
1. A capacitor header into which a terminal may be assembled, comprising: a rigid body having an axial hole for receipt of the terminal, and a resilient elastomeric tubular sealing element extending interiorly about said hole, said sealing element having plural axially spaced apart annular sealing beads at its interior side which extend transaxially inwardly for compression by the terminal upon assembly in said hole to form respective axially spaced apart line seals between the terminal and said sealing element.

4,525,023

ELECTRICAL CONNECTOR

Gustaf R. Lawson, Willingboro, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 12, 1983, Ser. No. 531,133
Int. Cl.³ H01R *13/12*
U.S. Cl. 339—258 R **1 Claim**



1. An electrical connector for use with tab terminals and the like comprising:
a. an asymmetrical, U-shaped spring member with a first leg providing a spring section and a second leg having laterally projecting ears; and
b. a terminal having a fastening section for fastening the terminal to an electrical device; a channel section for receiving the spring member with the spring section thereon being generally parallel to a floor of the channel section and providing therebetween a tab terminal receptacle, and posts on the sidewalls peened over the ears on the second leg to secure the spring member to the terminal.

4,525,024

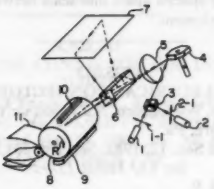
TWO-BEAM SCANNING OPTICAL SYSTEM

Kimio Tatsuno, Kokubunji, and Susumu Saito, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,772
Claims priority, application Japan, Nov. 6, 1981, 56-177220
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.5 **16 Claims**

1. A two-beam scanning optical system comprising:
a first laser light source for emitting a first laser beam having a polarization characteristic;
a second laser light source for emitting a second laser beam having a polarization characteristic;
a first optical means for compounding said first and second laser beams into one compounded laser beam by utilizing the respective polarization characteristics of said first and second laser beams;
a second optical means for scanning said compounded laser beam;
a third optical means for separating a laser beam emitted

from said second optical means into said first and second laser beams by utilizing the respective polarization characteristics of said first and second laser beams; and



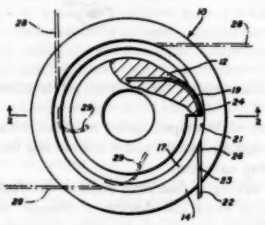
a fourth optical means disposed between said second and third optical means, for collecting the laser beam from said second optical means such that said first and second laser beams respectively scan predetermined scanning planes.

4,525,025

FIBER OPTIC ROTARY JOINT USING A REFLECTIVE SURFACE AND TANGENTIALLY MOUNTED ROTOR AND STATOR OPTICAL FIBERS

Thomas C. Hohmann, Blacksburg; Norris E. Lewis, Christiansburg, and Michael B. Miller, Blacksburg, all of Va., assignors to Litton Systems Inc., Blacksburg, Va.

Filed Mar. 21, 1983, Ser. No. 477,070
Int. Cl.³ G02B 5/14, 7/26
U.S. Cl. 350—96.15 **11 Claims**



1. A fiber optic rotary joint for coupling an optical signal across a rotary interface comprising:

a stator,

an annular reflective wall formed on said stator,

a stator optic fiber mounted on said stator and having an end in close proximity and tangential to said annular reflective wall,

a rotor,

a rotor optic fiber,

means on said rotor for positioning an end of said rotor optic fiber in close proximity and tangential to said annular reflective wall, whereby a signal emitted by one of said optic fibers will be projected tangentially against and reflected in short chordal paths along said annular reflective wall to be received by the other of said optic fibers.

4,525,026

OPTICAL FIBER PROTECTION BY POWDER FILLED COATINGS

Glenn R. Elion, Northborough, Mass., assignor to Aetna Telecommunications Laboratories, Westboro, Mass.

Filed Nov. 19, 1982, Ser. No. 442,919
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.23 **30 Claims**

22. A protectively coated optical waveguide resistant to attack by environmental substances, comprising:

an inner composite including an optically transmissive fiber coated with a layer of cladding material which enhances the optical performance of said fiber, and a protective layer surrounding said cladding material and bonded to it;

a layer of polymeric material surrounding said inner composite and bonded to it; and

powdered micron-to-submicron size material reactive with said environmental substances, said powdered material including particles of at least one of the constituents of said inner composite;

said cladding material comprising at least one material selected from the group consisting of oxides and nitrides of silicon, titanium, tin, boron, germanium, and phosphorous;

said protective layer comprising at least one material selected from the group consisting of aluminum, silicon, tin, titanium, nickel, lead, and oxides of these metals; and

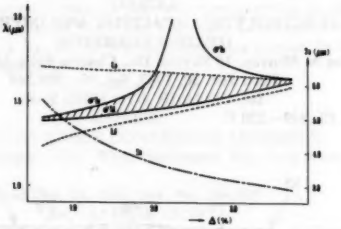
said powdered material being dispersed in said layer of polymeric material, forming therewith a buffer layer to protect said inner composite from attack by environmental substances.

4,525,027

SINGLE MODE OPTICAL FIBERS

Katsunari Okamoto; Takao Edahiro, both of Mito; Akio Kawana, Komae, and Tetsuo Miya, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Japan

Continuation-in-part of Ser. No. 518,772, Aug. 2, 1983, abandoned, which is a continuation of Ser. No. 192,259, Sep. 30, 1980, abandoned. This application Sep. 5, 1984, Ser. No. 648,334
Claims priority, application Japan, Oct. 8, 1979, 54-130449
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.30 **4 Claims**

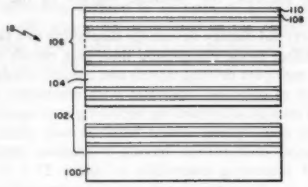


1. A single mode optical fiber comprising a core having a diameter of $2a$ and made of glass having a refractive index of n_1, and a cladding surrounding the core and made of glass having a refractive index of n_2 wherein when a refractive index difference Δ is expressed by $n_1-n_2/n_1\times 100$, said refractive indices n_1 and n_2 are determined to satisfy a relation $1.0<\Delta<3.6$ and the diameter $2a$ of said core is selected to have a value in a range of 4.8 to 3.0 microns as determined by the value of Δ.

4,525,028
ENHANCED MAGNETIC MIRROR

Terry A. Dorschner, Newton Center, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 257,304, Apr. 23, 1981,. This application May 11, 1984, Ser. No. 608,925
Int. Cl.³ G01B 9/02
U.S. Cl. 350—377 16 Claims

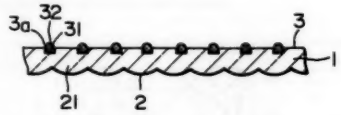


1. In combination:
a substrate;
means for producing a predetermined amount of reflectivity disposed on a surface of said substrate;
a semi-transparent layer of magneto-optical material disposed over a surface of said reflectivity producing means, said magneto-optical layer having a predetermined thickness;
means, disposed over a surface of the semi-transparent layer of magneto-optical material, for enhancing the reflectivity of said surface of said magneto-optical layer; and
wherein the predetermined thickness of the magneto-optical layer is different from the thickness required to provide phase equalization between waves reflected from an outer surface of the reflectivity enhancing means, the surface of the magneto-optical layer and the surface of the reflectivity producing means, with the reflectivity enhancing means and the reflectivity producing means being selected to provide such phase equalization.

4,525,029
REAR PROJECTION SCREEN

Masao Inoue; Shingo Suzuki, both of Tokyo, and Hajime Gotoh, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,301
Claims priority, application Japan, Dec. 27, 1982, 57-234409
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 15 Claims

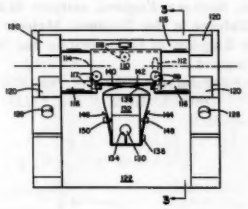


1. A rear projection screen comprising a projection surface upon which light from a projector impinges and a viewing surface, at least one of the screen surfaces being formed so as to serve as a lens so that the light which impinges on the projection surface produces on the viewing surface a multiplicity of bright stripe portions where the light is transmitted and a multiplicity of dark stripe portions where no light is transmitted, a plurality of elongated grooves formed along the dark stripe portions of the viewing surface and a corresponding plurality of thread-like members disposed in the elongated grooves as light-absorbing means.

4,525,030
POSITIONER FOR OPTICAL ELEMENT

Jean I. Montagu, Brookline, and Kurt A. Pelsue, Wayland, both of Mass., assignors to General Scanning Inc., Watertown, Mass.

Filed Aug. 26, 1982, Ser. No. 412,020
Int. Cl.³ G02B 7/04
U.S. Cl. 350—255 5 Claims

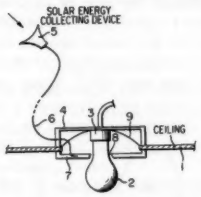


1. Apparatus for positioning an optical element at selected locations along an optical axis, comprising
a carriage on which said optical element is mounted,
support and guide means for holding said carriage, and confining it to substantially linear motion along said axis,
a moving-iron, limited-rotation actuator having a rotor and a rotor shaft rotatable over a range of angular excursions within a maximum operational angular excursion defined by the configurations of the stator and rotor pole faces of said actuator,
a crank arm connecting the shaft of said actuator to said carriage and arranged to drive said carriage in linear motion when the shaft of said actuator rotates,
the length of said crank arm being arranged with respect to said maximum operational angular excursion of said shaft to substantially match the inertia of said crank arm and the rotor of said actuator to the reflected inertia of said carriage, and
control means adapted to apply electrical signals to said actuator to controllably vary the rotary position of said rotor of said moving-iron, limited-rotation actuator and thereby the position of said optical element along said axis.

4,525,031
SOLAR LIGHT ENERGY AND ELECTRIC LIGHTING SYSTEM AND SOLAR AND ELECTRIC LIGHT LAMPS USED THEREIN

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 43,832, May 30, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,999
Claims priority, application Japan, Jun. 7, 1978, 53-67810; Jun. 13, 1978, 53-71271
Int. Cl.³ G02B 17/00
U.S. Cl. 350—265 7 Claims



1. A solar energy and electric lighting system, comprising:
a solar light energy collection means;
a solar light energy transmission means for transmitting the collected solar light energy; and
a solar light energy guide means for guiding the transmitted

solar light energy into an enclosure of an electric lamp through a transparent portion thereof,

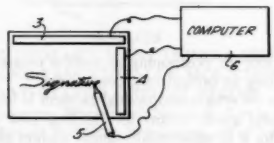
whereby said electric lamp may be also used for solar light energy illumination.

4,525,032

LIQUID CRYSTAL REUSABLE SIGNATURE COMPARISON

Cyril Hilsum, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 27, 1982, Ser. No. 385,263
Int. Cl.³ G02F 1/137, 1/133
U.S. Cl. 350—331 R **31 Claims**



1. A liquid crystal display comprising a layer of liquid crystal material contained between a front and a rear wall, a pen having a tip for contacting the front wall and changing the observed state of the layer at positions traced by the pen tip when moved across the front wall, means for erasing information formed by the pen movement, an optically transparent electrically resistive layer on the outer surface of the front wall for direct contact by the pen, and read out means for determining the instantaneous position of the pen on the display, wherein a visible image is formed on the display by virtue of the changed observed state of the liquid crystal material layer while an electrical representation of pen movement is obtained by virtue of the resistive layer in contact with the pen.

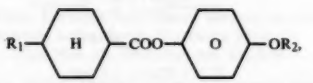
4,525,033

LIQUID CRYSTAL COMPOUND AND COMPOSITIONS CONTAINING SAME

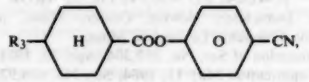
Tadashi Ota, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 46,583, Jun. 7, 1979, abandoned. This application Dec. 7, 1981, Ser. No. 328,155
Claims priority, application Japan, Jun. 8, 1978, 53-69228; Jul. 7, 1978, 53-82798; Jul. 26, 1978, 53-89018
Int. Cl.³ G02F 1/13; C09K 3/34
U.S. Cl. 350—350 R **25 Claims**

1. A method of presenting a display in a liquid crystal display device, comprising the step of applying multiplex driving signals to a liquid crystal composition having a positive dielectric anisotropy in the twisted nematic field effect mode, said composition consisting essentially of about 27.3 to 59.0 weight percent of at least one liquid crystal compound having the formula

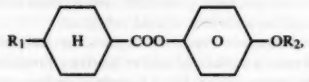


termed Type I wherein R_1 and R_2 and n-alkyl with one to six carbon atoms and about 41.0 to 72.7 weight percent of at least one liquid crystal compound having the general formula

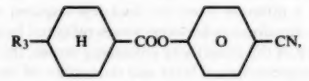


termed Type II wherein R_3 is n-alkyl with one to six carbon atoms, said Type I and Type II compounds included in the composition to increase the dynamic margin of the liquid crystal display device.

12. A liquid crystal display device for displaying in a twisted nematic field effect mode comprising multiplex circuit means for generating multiplex driving signals and a liquid crystal cell including a pair of opposed substrates with electrodes selectively disposed on said substrates for receiving said signals and a liquid crystal composition sealed between said substrates, said liquid crystal composition having a positive dielectric anisotropy and consisting essentially of about 27.3 to 59.0 weight percent of at least one liquid crystal compound having the formula



termed Type I, where R_1 and R_2 are n-alkyl with one to six carbon atoms and about 41.0 to 72.7 weight percent of at least one liquid crystal compound having the general formula



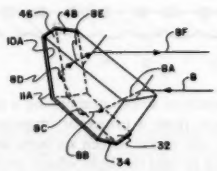
termed Type II wherein R_3 is n-alkyl with one to six carbon atoms, said Type I and Type II compounds included in said composition for increasing the dynamic margin of the display device said device selectively generating a display when the multiplex signals are applied to the electrode for applying a potential between opposed regions of the electrodes through said compositions for rendering the liquid crystal composition therebetween visually distinguishable from the remainder of the composition.

4,525,034

POLARIZING RETROREFLECTING PRISM

Clarke V. Simmons, 9020 Charles Augustine Dr., Alexandria, Va. 22308

Filed Dec. 7, 1982, Ser. No. 447,726
Int. Cl.³ G02B 5/30, 5/04
U.S. Cl. 350—395 **6 Claims**



1. A specially shaped right angle prism for polarizing and parallel retroreflecting light beams incident thereon at the Brewster's angle entrance surface wherein the Brewster angle of entrance to said prism is a soft angle giving said prism insensitivity to alignment with a large angle of freedom for said Brewster's angle, said prism comprised of a secondary internal

reflecting surface and a tertiary internal reflecting surface at a right angle to each other with each reflecting surface cut into the form of a roofed prism giving insensitivity to prism alignment in both planes of orientation with regard to the incoming beam and a cut-away of a truncated section cut at a 135° angle with respect to said secondary internal reflecting surface at a point making said secondary and tertiary internal reflecting surfaces of the same length wherein said truncated section portends from said entrance surface and said secondary internal reflecting surface to an apex of a wedge at an angle of $45°--\theta R$ where θR is defined as the refraction angle of an incident light beam and is a complimentary angle of the Brewster's angle θB.

4,525,035

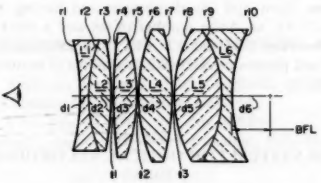
WIDE ANGLE EYEPIECE

Albert Nagler, 15 Green Hill La., Spring Valley, N.Y. 10977

Filed Jan. 5, 1984, Ser. No. 568,407

Int. Cl.³ G02B *9/58, 25/04*

U.S. Cl. 350—410 **1 Claim**



1. An eyepiece comprising a doublet, a singlet, a singlet, and a doublet, wherein each doublet includes a biconcave element cemented to a biconvex element and has a negative power, and each singlet is a biconvex lens with its stronger curvature facing the other singlet, and wherein the biconcave lens elements have a refractive index of 1.717 and an Abbe Number of 29.5 and the biconvex lens elements have a refractive index of 1.620 and an Abbe Number of 60.3, and wherein, for a 40 mm. focal length eyepiece, the lens data conforms substantially to the following table wherein lens radii, diameters, and axial thicknesses are given in millimeters:

Lens	Radii	Axial Thickness	Lens Diameter
	r1 = −98.30	d1 = 3.55	50
	r2 = +68.76	d2 = 10.22	50
	r3 = −123.86		
L3	r4 = +234.80	d3 = 10.22	56
	r5 = −82.86		
L4	r6 = +76.48	d4 = 15.32	60
	r7 = −111.24		
	r8 = +60.13	d5 = 21.21	60
L5, L6	r9 = −54.27	d6 = 4.42	
	r10 = +66.20		

and the separations between the doublets and the adjacent singlets, and between the singlets are 0.30 mm. air spaces.

4,525,036

ZOOM LENS

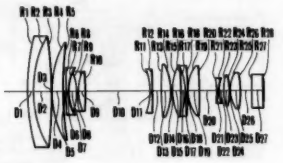
Kazuo Fujibayashi; Muneharu Sugiura, and Sadahiko Tsuji, all of Kanagawa, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 28, 1983, Ser. No. 470,623

Claims priority, application Japan, Mar. 8, 1982, 57-36922; Jul. 21, 1982, 57-127035; Jul. 23, 1982, 57-128563; Jul. 23, 1982, 57-128564; Oct. 14, 1982, 57-180677

Int. Cl.³ G02B *15/00*

U.S. Cl. 350—427 **7 Claims**



1. A zoom lens comprising:

four lens groups,

said four lens groups being, from front to rear,

a 1st lens group having a positive refractive power and movable for focusing,

a 2nd lens group having a negative refractive power and movable for changing the image magnification,

a 3rd lens group having a negative refractive power and movable for compensating for the shift of an image plane resulting from the change of the image magnification, and

a 4th lens group having two lens groups, or, from front to rear, a 4-1st lens group and a 4-2nd lens group, and having a positive refractive power as a whole,

said 4-1st lens group consisting of, from front to rear,

a bi-convex 4-1-1st lens having a strong refractive power at the rear,

a bi-convex 4-1-2nd lens having a strong refractive power at the front,

a 4-1-3rd lens of negative refractive power turning its concave surface toward the front, and

a 4-1-4th lens of positive refractive power turning its convex surface toward the front, and

said 4-2nd lens group consisting of, from front to rear,

a 4-2-1st lens of negative refractive power turning its concave surface toward the rear,

a bi-convex 4-2-2nd lens having a strong refractive power at the rear, and

a 4-2-3rd lens of positive refractive power having a strong refractive power at the front and turning its convex surface toward the front,

the axial separation between said 4-1-3rd lens and said 4-1-4th lens and the axial separation between said 4-2-1st lens and said 4-2-2nd lens being smaller than the axial separation between said 4-1-4th lens and said 4-2-1st lens, and said 4-1-2nd lens and said 4-1-3rd lens being axially separated from each other.

4,525,037

OBJECTIVE LENS ASSEMBLY OF VARIABLE FOCAL LENGTH HAVING A DIAPHRAGM MECHANISM WITH ADJUSTABLE APERTURE

Tsuneyo Metabi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 8, 1983, Ser. No. 502,204

Claims priority, application Japan, Jul. 9, 1982, 57-120320

Int. Cl.³ G02B *9/08, 7/10*

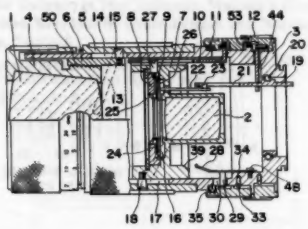
U.S. Cl. 350—450 **22 Claims**

1. An objective lens assembly of variable focal length comprising, in combination:

a varifocal lens system having its focal length adjustable

within a predetermined range, said lens system including a diaphragm mechanism having an adjustable diaphragm aperture, the aperture ratio being variable during an operation for changing the focal length with the diaphragm aperture kept unchanged;

a diaphragm aperture adjustng mechanism for adjusting the diaphragm aperture for compensating for change in aperture ratio realtive to the change in focal length within the predetermined range;



a diaphragm aperture maintaining mechanism operable to maintain the diaphragm aperture while allowing the aperture ratio to change within a portion of the predetermined range; and

a manually operable change-over mechanism operable to bring the diaphragm aperture adjusting and maintaining mechanisms selectively into an operative position one at a time.

4,525,038

FISH EYE LENS SYSTEM

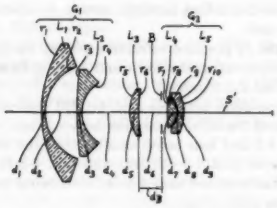
Rolf Müller, Wienerstr. 3, 7888 Rheinfelden, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,762

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119993

Int. Cl.³ G02B *9/60, 9/62*

U.S. Cl. 350—462 **21 Claims**



1. A five element fish eye lens system comprising from the object to the image side:

a first meniscus shaped lens (**L1**) of negative refractive power curved towards the object,

a second lens (**L2**) of negative refractive power curved towards the object,

a third positive meniscus lens (**L3**) of positive refractive power curved towards the object,

an aperture stop (**B**),

a fourth lens (**L4**) of positive refractive power curved towards the image, and

a fifth meniscus shaped lens (**L5**) of negative refractive power curved towards the image.

4,525,039

OBJECTIVE LENS

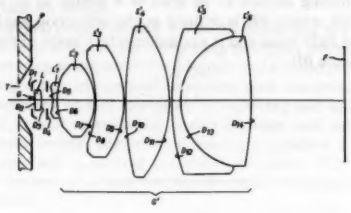
Jean-Louis Defuans, 9 Avenue du Bourcet, 38240 Meylan, France

Filed Feb. 22, 1983, Ser. No. 468,583

Claims priority, application France, Feb. 19, 1982, 82 02803

Int. Cl.³ G02B *9/60*

U.S. Cl. 350—465 **17 Claims**



1. An objective lens for a camera, said lens comprising an iris diaphragm being disposed at the front of said lens and an optical assembly being disposed behind said iris diaphragm, said optical assembly comprising a plano-convex front lens unit with its plane surface facing the front of said lens whereby said lens is suitable for use in media with different refractive indices, and a rear lens unit being adapted to apply the necessary correction to maintain abberations within reasonable limits and to achieve a required distance from said lens to the focal image plane, said iris diaphragm having an effective diameter of 0.25 mm., said plano-convex lens being disposed between 0.02 and 0.04 mm. from said iris diaphragm and having a refractive index of 1.45, an Abbe number of 68 and a thickness at the center between 0.08 and 0.11 mm., and wherein the rear surface of said plano-convex lens has a radius of between 0.92 and 0.93 mm.

4,525,040

LENS SYSTEM FOR OPTICAL RECORDING TYPE DISKS

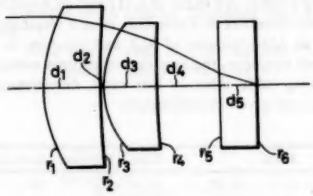
Toru Nakamura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,786

Claims priority, application Japan, Jun. 16, 1982, 57-102169

Int. Cl.³ G02B *3/02, 9/06*

U.S. Cl. 350—480 **5 Claims**



1. A lens system for optical recording type disks comprising a first lens and a second lens wherein said first lens is a positive lens and said second lens is a positive lens, said lens system for optical recording type disks being arranged to fulfill the condition (1) shown below and the entrance surface of said first lens being arranged as an aspherical surface expressed by a formula of aspherical surface including the term proportional to the sixth power of the incidence height, the vertex portion of said aspherical surface being approximately a spherical surface;

$$2.0 < f_1/f < 3.0 \quad (1)$$

where, reference symbol f represents the focal length of the lens system as a whole, and reference symbol f_1 represents the focal length of the first lens,

wherein said aspherical surface is expressed by the following formula:

$$x = \frac{\frac{y^2}{r}}{1 + \sqrt{1 - \left(\frac{y}{r}\right)^2}} + Ey^4 + Fy^6 + Gy^8 \ldots$$

where, reference symbol r represents the radius of curvature of the vertex portion of said aspherical surface, reference symbol x represents the distance from an arbitrary point on said aspherical surface to the tangential plane which is tangential to said aspherical surface at the point thereof on the optical axis, reference symbol y represents the distance from said arbitrary point to the optical axis, and reference symbols E, F, G, . . . respectively represent coefficients of aspherical surface:

said coefficients of aspherical surface E and F respectively fulfilling the conditions (2) and (3) shown below:

$$-0.12 < Ef^3 < -0.06 \quad (2)$$

$$-0.15 < Ef^5 < -0.08 \quad (3)$$

4,525,041

ARRANGEMENT FOR USE IN POSITIONING AN OPTICAL IMAGE

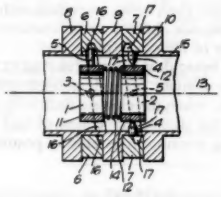
Stanley W. Andrews, Worcester Park, England, assignor to Precision Grinding Limited, Surrey, England

Filed Feb. 22, 1983, Ser. No. 468,848

Claims priority, application United Kingdom, Feb. 24, 1982, 8205480

Int. Cl.³ G05D *1/02*

U.S. Cl. 350—484 **2 Claims**



1. An arrangement for use in positioning an optical image with respect to an optical axis, said arrangement including first and second optical elements arranged on the optical axis, first and second pivotal mounting means for pivotally mounting the first and second optical elements to turn about first and second axes respectively, the first and second axes being positioned at right angles to each other and perpendicular to the optical axis, first and second rotatable ring members which are turned about the optical axis, means for respectively coupling the first pivotal mounting means to the first rotatable ring member and for coupling the second pivotal mounting means to the second rotatable ring member whereby a rotation of the first rotatable ring member causes the first mounting means and the first optical element to be tilted about the first of the axes and a rotation of the second rotatable ring member causes the second mounting means and the second optical element to be tilted about the second of the axes.

4,525,042

OPTICAL SYSTEM OF VARIABLE FOCAL AND BACK-FOCAL LENGTH

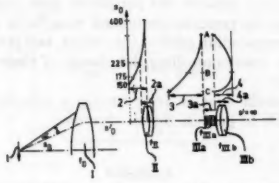
Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Jan. 5, 1983, Ser. No. 455,666

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202075

Int. Cl.³ G02B *15/16*

U.S. Cl. 350—519 **5 Claims**



1. An optical system of variable focal and back-focal length for operation microscopes, comprising an objective (I) of fixed focal length, combined with an optical system of variable focal length including a first lens group (II) and a second lens group (III*a*, III*b*), the objective projecting an image of an object, and the first lens group of the system being displaceable and imaging the image projected by the objective onto the focal point of the second lens group (III*a*, III*b*) of the system, the components of the second lens group (III*a*, III*b*) being displaceable on the optical axis and being coupled together for movement in order to change the focal length of the system.

4,525,043

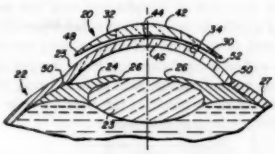
CONTACT LENS

Leonard Bronstein, 2928 N. 30th St., Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 850,857, Nov. 11, 1977, abandoned. This application Apr. 21, 1980, Ser. No. 141,949

Int. Cl.³ G02C *7/04, 7/06*

U.S. Cl. 351—160 R **20 Claims**



1. A corneal contact lens for correcting the vision of an eye of a patient, said lens comprising:

a lens body made of a refractive material, said body having an anterior surface and a posterior surface, said posterior surface having a central zone, an intermediate zone, and a peripheral zone, said anterior surface having a central zone corresponding to the central zone of the posterior zone, the portion of the lens body defined by the posterior and anterior central zones substantially defining the optically effective portion of the lens for correcting the vision of the wearer;

the central zone of the posterior surface having a chord diameter and a radius of curvature;

the chord diameter being preferrably larger than the largest measurable chord diameter of the pupil of the eye of the patient but which is equal to or less than the maximum measured central spherical radius of curvature of the cornea of the patient;

the radius of curvature of the posterior central zone being

such that the sag depth difference between the measured greatest central spherical radius of curvature of the cornea and that of the posterior central zone of the lens is in the range of from 0–15 microns;

the central zone of the anterior surface having a radius of curvature which, in conjunction with the posterior surface of the central zone, provides the proper power factor to provide the patient with substantially normal distance vision;

the intermediate annular zone of the posterior surface being aspheric with a curvature that increases continuously from its least value adjacent the central zone to its maximum value adjacent the peripheral zone, said curvature adjacent the posterior peripheral zone being greater than the corresponding zone of the cornea, said posterior intermediate zone controlling the change of shape of the cornea; and

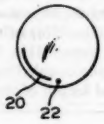
the peripheral annular zone having a spherical radius of curvature to provide limbal clearance.

4,525,044

SOFT CONTACT LENS WITH SURFACE IDENTIFICATION AND METHOD OF USING SAME

Robert C. Bauman, 86 Goodhouse Rd., Litchfield, Conn. 06759

Filed May 5, 1983, Ser. No. 491,891
Int. Cl.³ G02C *7/04*
U.S. Cl. 351—160 H **21 Claims**



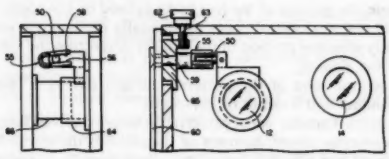
1. A soft contact lens of generally symmetrical concavo-convex configuration with uniform optical power about the optic axis and having an inner surface for placement against the eye and an outer surface, said surfaces having a peripheral portion adjacent the circumference thereof, said peripheral portion of one of said surfaces having a circumferentially elongated directional marking thereon which is asymmetrical about its midpoint to enable the user to identify readily the inner surface of the lens by the direction of asymmetry, said lens being cast or molded from a synthetic resin which is homogeneous throughout said lens and of uniform coloration, said indicia being of sufficient size and of a configuration to be interpretable by the wearer without magnification, said indicia being substantially nondiscernable when in place in the user's eye to avoid cosmetic blemish.

4,525,045

CAMERA FOR THREE-DIMENSIONAL MOVIES

Carl F. Fazekas, Tarzana, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Jan. 23, 1984, Ser. No. 573,085
Int. Cl.³ G03B *35/00*
U.S. Cl. 352—57 **25 Claims**



1. A lens system adapted to couple to a camera for recording images on film comprising:

a first lens for receiving light;

a second lens for receiving light;

means for focusing said first and second lenses by moving said first lens in a direction along a first axis and moving said second lens in a direction along an axis parallel to said first axis; and

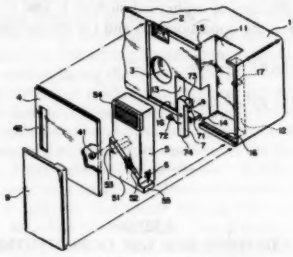
vertical means for causing said second lens to move in a direction having a component along a second axis substantially perpendicular to said first axis in response to movement of said second lens along said first axis.

4,525,046

CASELESS CAMERA

Yukio Takaoka; Masaaki Morizumi, and Norimichi Takahashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,384
Claims priority, application Japan, Jan. 20, 1983, 58-6245[U]
Int. Cl.³ G03B *15/03*
U.S. Cl. 354—149.11 **3 Claims**



1. A caseless camera comprising;

a camera body;

a cover plate mounted at the front of the camera body slidably between its closing and opening positions, said cover plate being provided with a contact member at the rear side thereof;

an electric flash mounted inside the camera body longitudinally movably between its restoring and operating positions, said electric flash being provided with an inclined step at the front side thereof to be contacted with said contact member of the cover plate; and

said electric flash being downwardly moved to its restoring position by the contact of said inclined step with said contact member, when the electric flash is in its operating position, upon the sliding movement of said cover plate from its opening position to its closing position.

4,525,047

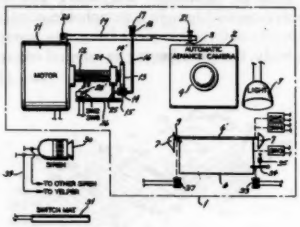
BURGLAR AND INTRUDER DETECTION SYSTEM

Harold P. Myers, S. Harding St., P.O. Box 46, Marquand, Mo. 63655

Filed Apr. 5, 1982, Ser. No. 365,542
Int. Cl.³ G03B *17/46, 1/12*
U.S. Cl. 354—173 **10 Claims**

1. A burglar and intruder detection system for photographing burglars and other intruders, said system comprising a mechanically trippable camera of the automatic advance type for sequentially taking a plurality of successive pictures upon being repeatedly tripped, an electric motor, a shaft for being rotatably driven by the motor, the shaft having a cam presenting at least one lobe, trip means actuatable by the cam lobe for repeatedly tripping the camera upon operation of the motor, first electric switching means for providing electric power for initiating operation of the motor in response to detection of the presence of an intruder, delay means driven by the shaft for establishing a predetermined time interval following the initia-

tion of motor operation, second electric switching means operable in response to the delay means for de-energizing the motor after the predetermined time interval, and concealment means for concealing and protecting the camera including an enclosure for the camera, electric motor and shaft, and a cover



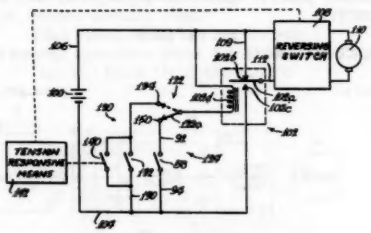
movable between enclosed positions concealing and an open position uncovering said camera for picture taking, means for driving said cover between said positions, said driving means moving said cover to its closed position in response to operation of the second switching means.

4,525,048

AUTOMATIC SLOT POSITIONING DEVICE FOR CAMERA TAKE-UP SPOOL

Wan C. Wong, North Point, Hong Kong, and Shigeru Oshima, Tokyo, Japan, assignors to W. Haking Enterprises, Limited, Hong Kong

Filed Mar. 21, 1983, Ser. No. 477,247
Int. Cl.³ G03B 1/12
U.S. Cl. 354—173.1 **16 Claims**



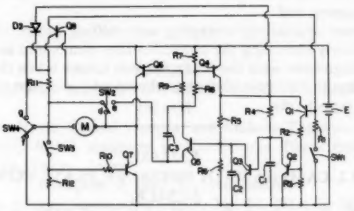
1. In a still camera including a housing having a film chamber for receiving a film cartridge with a film leader extending therefrom, said chamber defining a film path therein and including a cartridge-receiving space for receiving said cartridge for drop-in loading and located at one end of said film path, a take-up spool space at the other end of said film path having a take-up spool, said take-up spool having a slot for receiving the end of the film leader, the improvement comprising aligning means for automatically aligning said take-up spool slot with said film path for receipt of the film leader in said slot when said camera is conditioned to receive a film cartridge in said cavity, a manually-operable means including a film chamber door initially covering said chamber and movable thereon to uncover the same, and wherein said aligning means includes motor means for driving said take-up spool, and means responsive to the opening of said door to operate said motor means to drive said take-up spool until said slot is aligned with said film path.

4,525,049

MOTOR DRIVING DEVICE OF A CAMERA

Harumi Ogawa; Fumito Obikawa, both of Chino; Toshio Koyama, Suwa; Yoshiaki Otsubo, Yokohama; Hiroshi Wakabayashi, Yokohama, and Tadashi Otani, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,423
Claims priority, application Japan, Oct. 20, 1982, 57-182996
Int. Cl.³ G03B 1/18
U.S. Cl. 354—173.11 **10 Claims**



1. A device for flowing a driving current to a motor to drive the motor, comprising:

(a) capacitor means charged with charge, said capacitor means producing a voltage corresponding to the charged charge; and

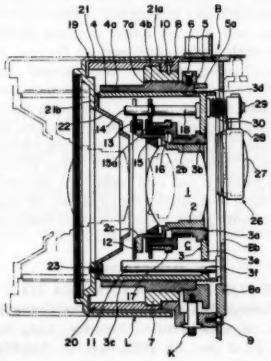
(b) supplying means responsive to the charging current flowing into said capacitor means to supply the driving current to said motor, said supplying means including charging means for supplying the charging current to said capacitor means and means for discharging the charge charged in said capacitor means during the supply of the driving current to said motor.

4,525,050

PHOTOGRAPHIC CAMERA WITH BUILT-IN OPTICAL CONVERTER

Saichiro Ohashi, Kyoto, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 23, 1983, Ser. No. 468,838
Claims priority, application Japan, Feb. 24, 1982, 57-29572
Int. Cl.³ G03B 3/00
U.S. Cl. 354—195.12 **5 Claims**



1. A photographic camera comprising, in combination:

a camera body including a front wall having an opening therein at a position opposed to a focal plane within the camera body where a photosensitive film, when loaded in the camera, is positioned;

an objective lens assembly including an objective lens means

providing a principal optical system of a first predetermined focal length and a lens mount means for supporting the objective lens means in alignment with the opening in the front wall of the camera body;

a converter lens means carried by the lens mount means for movement together therewith in a direction parallel to the optical axis of the lens assembly;

means for shifting the lens mount means in a direction parallel to the optical axis between a first mode position where the converter lens means is out of alignment with the objective lens assembly and a second mode position where the converter lens is aligned with the objective lens means; and

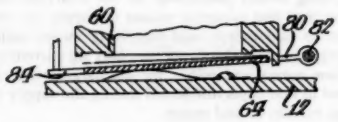
means operatively engaging said shifting means for selectively switching the converter lens means into and out of alignment with the objective lens means when the object lens assembly is shifted to the second and first positions, respectively.

4,525,051

STILL CAMERA WITH PRESSURE PLATE CONTROL DEVICE

Wan C. Wong, North Point, Hong Kong, and Shigeru Oshima, Tokyo, Japan, assignors to W. Haking Enterprises, Limited, Hong Kong

Filed Mar. 21, 1983, Ser. No. 477,246
Int. Cl.³ G03B *17/28*
U.S. Cl. 354—203 **5 Claims**



2. A still camera including a housing having a film chamber for receiving a film cartridge with a film leader extending therefrom, said chamber defining a film path, a film leader-receiving channel leading from said film path to an outer margin of said housing, said channel being sized to receive and guide said leader upon edgewise insertion thereof, a cavity for receiving said cartridge for drop-in loading in the direction of the plane of the film, said cavity being at one end of said film path, and a cavity housing a take-up spool at the other end of said film path, an imaging area adjacent one side of said film path and a pressure plate in said housing on an opposite side of said film path and genreally aligned with the imaging area, biasing means normally biasing said pressure plate towards said imaging area and into an initial position to force film into engagement with a film plane surface thereat, a door closing off said film chamber to cover said channel and cavities and movable between said film chamber opening and closing positions, and plate moving means for moving the pressure plate away from said imaging area to accommodate free movement of the film into said film leader-receiving channel when said door is opened, said pressure plate being pivoted along one edge in said housing and said means for moving the pressure plate including a mechanism for engaging an opposite edge to pivot said pressure plate away from said imaging area.

4,525,052

DEVICE FOR FIXING A CAMERA TO A TRIPOD

Yoshinobu Kosugi, Tokyo, and Kaoru Tachibana, Kawagoe, both of Japan, assignors to Slik Tripod Co., Ltd., Japan

Filed Dec. 23, 1983, Ser. No. 564,681
Claims priority, application Japan, Jan. 27, 1983, 58-10522[U]; Jan. 27, 1983, 58-10523[U]
Int. Cl.³ F16M *11/04*; G03B *17/56*
U.S. Cl. 354—293 **18 Claims**

1. A device for fixing a camera to a universal head of a tripod which comprises:

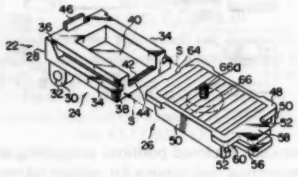
a base which is adapted to be attached on the upper end portion of the universal head, said base having in its surface guiding sections and an engagement portion; and

a slider to which a camera is to be fitted, and which includes;

a slide body,

integral guided sections which are formed on the surface of the slide body to be slidably engaged with the guiding sections, whereby said slider can be slidably mounted on said base in a detachable condition, and

an elastically deformable piece integrally formed with the slide body, the piece having an integral engaged portion



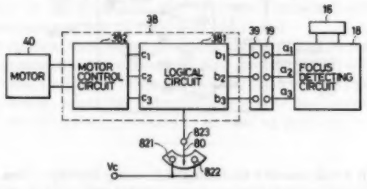
and a free end, the integral engaged portion being elastically engaged with the engaging portion of said base when said slider is set on said base and the free end serving to cause the piece to be elastically deformed by an external force, whereby said slider is securely fixed on said base by the interlock between the engaging portion and the engaged portion, and said slider is removed from said base after the interlock is released by the forced deformation of the piece which occurs by an external force applied to the free end of the piece.

4,525,053

MOTOR-DRIVABLE PHOTOGRAPHING LENS ASSEMBLY

Yoshiharu Shiokama, and Shigeru Suzuki, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,013
Claims priority, application Japan, May 10, 1982, 57-150387[U]
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—400 **7 Claims**



1. A photographing lens assembly provided with a moving lens system which is movable within a given moving range to change the optical characteristics and the movement of which is controlled by an electrical driving apparatus, said lens assembly comprising:

(a) mechanical limiting means which acts on said moving lens system when said lens system has been moved up to the limit of the moving range in order to inhibit any further movement of said lens system beyond said limit; and

(b) electrical limiting means including means for producing an electrical signal when said moving lens system movable by said electrical driving apparatus reaches a position lying a determined amount before the limit of said given moving range and electric circuit means for inhibiting the control for further moving said lens system in the same direction by said electric driving apparatus.

4,525,054
CAMERA

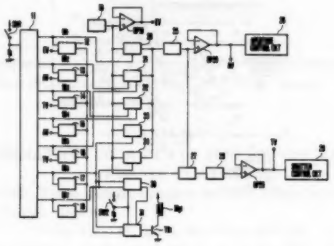
Hiromi Someya, Kanagawa; Yoshihiko Aihara, Tokyo; Toyokazu Mizogui, and Nobuyuki Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,494

Claims priority, application Japan, Jun. 20, 1983, 58-111717; Jun. 20, 1983, 58-111718; Jun. 20, 1983, 58-111719; Jun. 20, 1983, 58-111720

Int. Cl.³ G03B *7/087*

U.S. Cl. 354—443 **8 Claims**



4. A camera having a self-timer mode, comprising:

(a) an exposure control circuit having a self-timer mode in which an aperture is restricted within a wider opening aperture range by an exposure control restricting part; and

(b) self-timer photographing selecting means for selecting self-timer photography, exposure control being arranged to be carried out in said self-timer mode when self-timer photography is selected by said selecting means.

4,525,055
PHOTOGRAPHIC CAMERA HAVING BATTERY REMAINING LIFE INDICATING MEANS

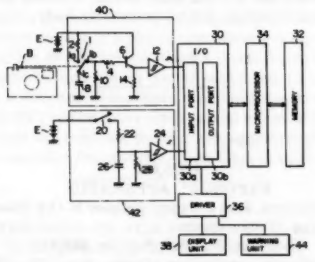
Hirokazu Yokoo, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashicara, Japan

Filed Jul. 16, 1984, Ser. No. 630,948

Claims priority, application Japan, Jul. 15, 1983, 58-129223

Int. Cl.³ G03B *17/18;* **G08B** *21/00*

U.S. Cl. 354—468 **7 Claims**



1. A battery remaining life indicating means for photographic cameras which are provided with systems operated under electric power supplies from batteries and have at least two photographing modes of different power consumptions, said indicating means comprising battery life memorizing means having a memory of a battery life in terms of number of possible exposures under a first photographing mode which is calculated on the basis of capacity of battery loaded in the camera and the power consumption under the first photographing mode, modifying factor memorizing means having a memory of a modifying factor which is the power consumption under a second photographing mode measured taking the power consumption under the first photographing mode as a unit, battery life display means for displaying the battery life memorized in the battery life memorizing means, photographing exposure detecting means, photographing mode discriminating means, operating means responsive to said photographing exposure detecting means to rewrite the memory of the battery life in said battery life memorizing means by subtracting one when the discriminating means detects the first photographing mode and by subtracting said modifying factor when the discriminating means detects the second photographing mode.

4,525,056
DEVELOPING MEANS FOR ELECTROSTATIC LATENT IMAGE

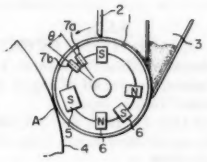
Masahiko Itaya; Satoshi Haneda, and Makoto Tomono, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,630

Claims priority, application Japan, Jul. 10, 1981, 56-108445

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **7 Claims**



1. A developing means for developing an electrostatic latent image on a developing area of an image forming member comprising a non-magnetic developer transport member, a series of magnets arranged inside said non-magnetic transport member, and a developer layer thickness regulating member for regulating a developer layer on the non-magnetic developer transport member, wherein a plurality of said magnets is arranged in series in a defined area between the developer layer thickness regulating member and said developing area opposite said image forming member so as to generate a magnetic flux distribution having a pair of homopolar peaks for eliminating a density unevenness of the developer layer on said transport member.

4,525,057
GUIDE PATH FOR TRANSFER OF SHEETS TO A FIXING APPARATUS OF A COPYING MACHINE

Heinrich Kaufmann, Stuttgart, and Friedhelm Brenner, Reichartshausen, both of Fed. Rep. of Germany, assignors to Develop Dr. Eisbein GmbH & Co., Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,267

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136310

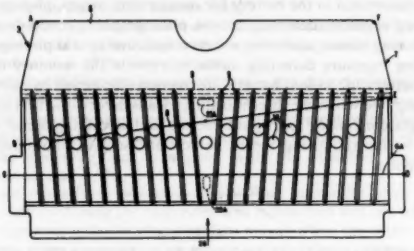
Int. Cl.³ G03G *15/20, 15/00;* **B65H** *9/00, 5/06*

U.S. Cl. 355—3 FU **8 Claims**

1. In an apparatus for the transport of sheets of paper including in a photocopying machine, a first paper handling station and a fixing station having a pair of pressing rolls with respective pressing roll axes inclined to one another to form a pressing gap which is angularly inclined with respect to the paper transport direction of said sheets as they leave said first paper handling station, the improvement comprising:

paper guide path means disposed between said first paper handling station and said fixing station, said paper guide

path means defining different paper travel lengths across the width of a sheet of paper traveling thereover so that all



parts of the forward edge of that sheet simultaneously reach said pressing gap.

4,525,058

IMAGE FIXING DEVICE

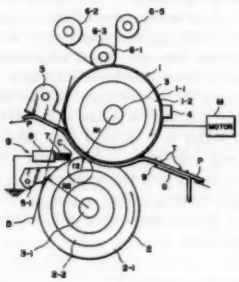
Hiromitsu Hirabayashi; Masaaki Sakurai, both of Yokohama, and Kazuo Kagiura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,616

Claims priority, application Japan, Oct. 15, 1982, 57-181814; Feb. 28, 1983, 58-33039

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **34 Claims**



1. An image fixing device, comprising:

first and second rotatable members for forming a nip therebetween, which transport from an entrance side to an exit side a recording material and fix an image thereon;

means for driving said first and second rollers;

charge removing means having charge removing ends arranged along the longitudinal direction of said rotatable members and adjacent to but spaced from the peripheral surface of said first rotatable member, wherein each charge removing end is positioned within a predetermined exit-side region of a plane transverse to said longitudinal direction, the boundaries of which planar region are defined by the common tangent line which is tangent to the peripheral surface of both rotatable members on the exit side and the peripheral surfaces of said first and second rotatable members from their respective tangent points to the common exit and press-contact area between said rotatable members.

4,525,059

EXPOSURE APPARATUS TO GUIDE REFLECTED LIGHT FROM A SUBJECT TO A PHOTOSENSITIVE BODY

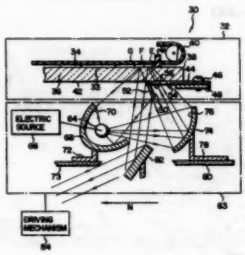
Toshio Haramaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 28, 1982, Ser. No. 425,992

Claims priority, application Japan, Nov. 4, 1981, 56-176906

Int. Cl.³ G03G *15/04*

U.S. Cl. 355—8 **14 Claims**



1. An exposure apparatus for exposing a subject to light and guiding the light reflected from the subject to a photosensitive body, said apparatus comprising:

an exposure table including means defining an exposure region for receiving the subject and permitting illumination of the subject with light beams;

light beam projecting means for projecting first light beams to the exposure region in one direction and second light beams in another direction to illuminate the subject with light beams;

mask means including (a) a shielding portion having a white-colored face for shielding one portion of said exposure region from said first light beams; (b) a support portion integrally joined to said shielding portion; (c) means for fixing said support portion to said document table so that said shielding portion forwardly extends into said projected light beams; and (d) means defining a light beam transparent region intermediate said shielding and support portions to permit said second light beams to pass therethrough; and

guide means for guiding light beams reflected from said exposure region to said photosensitive body.

4,525,060

EXPOSURE APPARATUS

Hiroshi Miyamoto, Tokyo, Japan, assignor to Orc Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,315

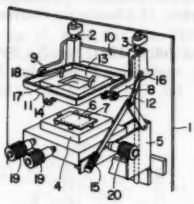
Claims priority, application Japan, Apr. 28, 1982, 57-62704[U]

Int. Cl.³ G03B *27/42, 27/28*

U.S. Cl. 355—53 **4 Claims**

1. Film exposure apparatus comprising first frame means, a photosensitive flat plate body secured to said frame means, a second frame means positioned above said first frame means and vertically moveable with respect thereto for engagement therewith, a mask body mounted on said second frame means in vertical alignment with said photosensitive flat plate body, said second frame means being rotatable about at least one axis passing through near the center point of said mask body

wherein when said mask body is brought into close contact with said photosensitive flat plate body over their respective



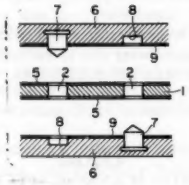
whole opposed surfaces, and means to move said second frame means into engagement with said first frame means.

4,525,061

COMBINATION OF A PLATE FOR EXPOSURE AND FRAME PLATES

Toshiro Oki, Tama, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,538
Claims priority, application Japan, Jun. 14, 1982, 57-101620
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—72 **3 Claims**



1. In a combination of a plate for exposure having a pair of photosensitive layers formed on its opposite surfaces, and a pair of transparent frame plates between which said plate for exposure can be sandwiched, a mask being provided on that surface of each of said frame plates which faces said plate for exposure, the improvement wherein said plate for exposure is formed with a pair of apertures adjacent to each of a pair of opposite edges thereof, each of said frame plates being provided adjacent to each of a pair of opposite edges thereof with a pin facing one of said apertures and a recess facing the other of said apertures, said pin on one of said frame plates facing said recess in the other frame plate, said pins being so sized and shaped that they can be easily fitted in, and removed from said apertures, and can hold said frame plates against displacement relative to said plate for exposure when fitted in said apertures.

4,525,062

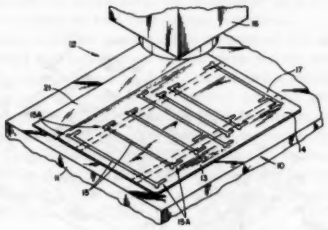
POSITIONING JIG FOR POSITIONING COPY MATERIAL FOR OFFSET PRINTING

Alfred L. Clark, P.O. Box 53, Zionsville, Ind. 46077

Filed Sep. 12, 1983, Ser. No. 530,969
Int. Cl.³ G03B *27/42, 27/58*
U.S. Cl. 355—72 **17 Claims**

1. A positioning jig for positioning copy material on the copyboard of a photographic print plate maker, said plate maker used to make an offset print plate bearing an image of the copy material, comprising:

a base having a top facing surface and one or more positioning stops recessed within said base, each of said one or more positioning stops providing means, including a pair of mutually perpendicular side walls having a relatively low height with respect to the length of said side walls, for accurately positioning said copy material without said



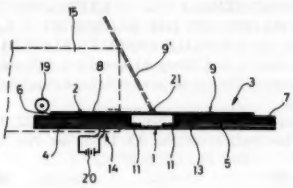
positioning stops casting an image which is photographically perceptible by said plate maker.

4,525,063

PAPER HOLDER FOR A PHOTOCOPYING MACHINE

Jürgen Eisbein, Gerlingen, Fed. Rep. of Germany, assignor to Develop Dr. Eisbein GmbH & Co., Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,111
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244388
Int. Cl.³ G30B *27/58*
U.S. Cl. 355—72 **14 Claims**



1. Paper holder for a photocopying machine of the type which holds stacked paper sheets to be copied on and which is selectively insertable into the machine to a position accomodating machine withdrawal of sheets therefrom, said paper holder comprising first and second stack holding sections disposed one behind the other, said sections exhibiting respective oppositely facing end regions which are sufficiently similarly configured to accomodate selective insertion of the paper holder with a respective one or the other of the stacks in the sections being accessible to a paper withdrawing mechanism of a photocopying machine.

4,525,064

COPIER APPARATUS

William E. Grover, 2407 Wapiti Rd., Ft. Collins, Colo. 80525, and Anthony R. Bruce, Berthoud, Colo., assignors to William E. Grover, Fort Collins, Colo.

Filed Jul. 12, 1982, Ser. No. 397,101
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **23 Claims**

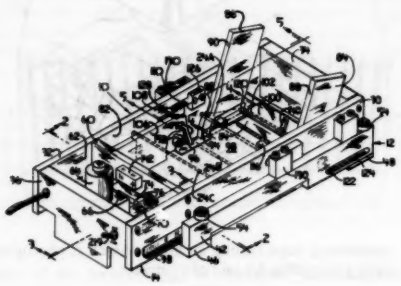
1. Copier apparatus for use with a machine that prepares a copy from an information-carrying master placed atop a surface through which said master is reproducingly exposed, said apparatus comprising:

an information-carrying master within which is defined a window through which a card placed over said window is reproducingly exposed along with other matter carried upon the surface of said master;

an assembly disposed above said master and including means for accepting a stack of cards individually carrying re-

spective different notations to be reproducingly exposed through said window;

and handling means included in said assembly for placing



successive different ones of said cards in a position over said window and for correspondingly moving successive ones of said cards from said position into a storage location.

4,525,065

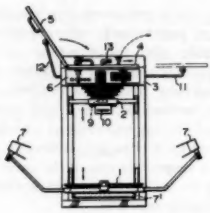
METHOD FOR CONTROLLING AN EXPOSURE TIME IN CONSIDERATION OF THE RECIPROCITY LAW FAILURE OF A PHOTOSENSITIVE MATERIAL

Tsuneo Takagi, Kurita, and Hiroyuki Yonehara, Hikone, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Continuation-in-part of Ser. No. 275,698, Jun. 22, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,658

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **4 Claims**



1. A method for controlling the exposure time in the reciprocity law failure range of a photosensitive material, in a picture reproducing machine, wherein the response time variation cause by variations is corrected according to the operational equation for the reciprocity law when the photosensitive material is in its linear range, said method comprising exposing said photosensitive material for a time T_m in accordance with the relationship;

$$Tm\left(\frac{1+Mi}{2}\right)^{2P}\cdot T_0$$

wherein T_0 is the correct exposure time in the absence of reciprocity law failure, M_i is the desired reproduction scale and P is an empirically determined coefficient which is greater for enlargements than reductions.

4,525,066

METHOD AND DEVICE FOR MEASURING TEMPERATURE USING A DIFFRACTION GRATING

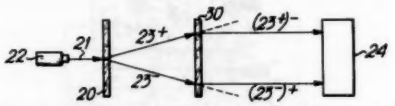
Michel Guillaume, Les Blétières - Les Adrets, 38190 Brignoud, and Michel Pichot, 11 Chemin du Couvent, 38100 Grenoble, both of France

Filed Jul. 8, 1982, Ser. No. 396,446

Claims priority, application France, Jul. 21, 1981, 81 14176

Int. Cl.³ G01J *5/08, 5/38*

U.S. Cl. 356—43 **10 Claims**



1. A temperature measuring device comprising a first diffraction grating heated to the temperature to be measured, a monochromatic beam source emitting a light beam directed onto said first grating, said light beam given two once diffracted beams after said first grating with opposite diffraction orders +n and −n (in which n is an integer equal to or above 1), a second diffraction grating placed on the paths of said two diffracted beams, said first and second gratings having similar spacings, said second grating being raised to a reference temperature, each once diffracted beam of orders +n and −n impinging onto said second grating and given twice diffracted beams of orders respectively −n and +n, and measuring means positioned so as to receive said twice diffracted beams, said measuring means being able to measure the angular variation between said twice diffracted beams.

4,525,067

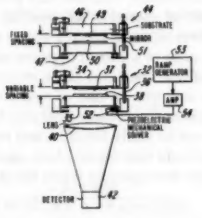
TWIN-ETALON SCANNING SPECTROMETER

Gonzalo J. Hernandez, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 22, 1982, Ser. No. 436,124

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—346 **18 Claims**



15. A method for increasing spectrometer luminosity, said method comprising:

providing first and second etalon means each of which provides an output responsive to received radiation that has predetermined angles of transmission;

positioning said second etalon means in alignment with said first etalon means to receive the output therefrom; and

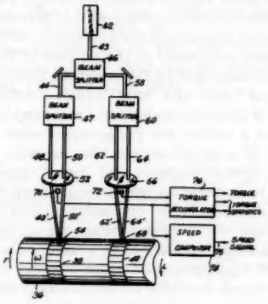
causing one of said etalon means to vary said output so that at least in one instance the outputs of said first and second etalon means have the same angles of transmission and in other instances an intentional mismatch is introduced to thereby modulate said radiation passing through said etalon means for luminosity enhancement.

4,525,068

TORQUE MEASUREMENT METHOD AND APPARATUS

Seetha R. Mannava, Latham, and Joseph W. Erkes, Menands, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1982, Ser. No. 419,241
Int. Cl.³ G01P *3/36*; G01L *3/12*
U.S. Cl. 356—35.5 **12 Claims**



1. Apparatus for measuring twist in a body, said body being subjectable to a torque applied at a first location and said torque being resistable by a load at a second location, comprising:

first means for measuring a first velocity at a first region on a surface of said body;

second means for measuring a second velocity at a second region on a surface of said body;

said second region being closer to said load than said first region; and

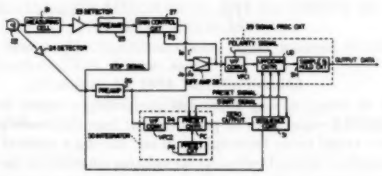
means for accumulating a difference between said first and second velocities, said difference being related to said twist.

4,525,069

OPTICAL ABSORPTION ANALYZER

Masaru Tanaka; Naoki Noguchi; Kenji Yoshino, and Osamu Saitoh, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Apr. 23, 1982, Ser. No. 371,484
Claims priority, application Japan, May 19, 1981, 56-75120
Int. Cl.³ G01N *21/61*
U.S. Cl. 356—435 **6 Claims**



1. An optical absorption analyzer for determining the concentration of a particular component of a gas mixture, said analyzer comprising:

a light source;

first and second optical detectors and at least one cell arranged in an optical path between said light source and said first and second optical detectors, said detectors and at least one cell arranged such that during a first process, one of either a zero gas and a sample gas to be measured is passed through said at least one cell and, during a second process, the gas different from that of said first process is passed through said at least one cell;

a gain control circuit connected to an output of said first optical detector for controlling the amplitude of a first signal which is output by said first optical detector;

a differential amplifier connected to outputs of said gain control circuit and said second optical detector for amplifying the difference between said first signal and a second signal which is output by said second optical detector, said differential amplifier having an output which is fed back to said gain control circuit for controlling the operation thereof;

an integrator connected to said output of said second optical detector for integrating said second signal and for outputting an agreement signal when the integrated value reaches a predetermined value; and

a signal processing circuit means having an input connected to an output of said differential amplifier and having means for integrating, storing and comparing signals input thereto;

wherein, during said first process, the gain of said gain control circuit is controlled so that said first signal from said first optical detector is equal in value to said second signal from said second optical detector at a predetermined accuracy, and said output from said differential amplifier is integrated by said signal processing means from an instant of time when said integrator begins to integrate to an instant of time when said integrator outputs said agreement signal which is input to said signal processing means and the resulting integrated value is stored by said signal processing circuit means; and wherein,

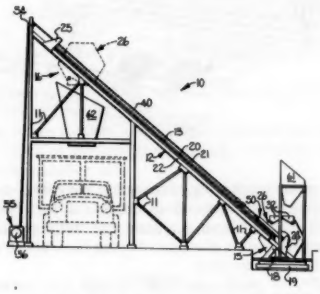
during said second process, said signal output from said differential amplifier is integrated by said signal processing circuit means from an instant of time when said integrator begins to integrate to an instant of time when said integrator outputs said agreement signal, and the resulting integrator value is then compared with said integrated value stored during said first process so as to analyze said component to be analyzed.

4,525,070

ROTARY MIXING APPARATUS

Tatum W. Gressette, Jr., Highway 601 North, Box 318, St. Matthews, S.C. 29135

Filed Apr. 8, 1983, Ser. No. 483,289
Int. Cl.³ B01F *9/06*; B28C *5/22*
U.S. Cl. 366—18 **10 Claims**



1. An apparatus for weighing, mixing, and transporting a mixture of dry granular or wet materials, and which is characterized by the materials being simultaneously mixed and transported, and comprising

a trackway including a pair of parallel, laterally spaced apart rails, with said trackway defining a receiving end portion and a discharge end portion, and with said receiving end portion being physically unconnected to the remaining portions of said trackway,

a mixing container adapted for receiving the materials to be mixed and including a peripheral outer wall comprising a

plurality of flat wall sections, opposite parallel end walls, a door positioned in said peripheral outer wall, axle means fixedly mounted to each of said end walls and extending coaxially outwardly therefrom so as to define a central axis, and wheel means fixedly mounted to each of said axle means and operatively engaging respective ones of said rails of said trackway, and such that the container may be moved along said trackway while being rotated about said central axis,

weighing means operatively connected to said receiving end portion of said trackway for permitting the container and its contents to be weighed when said container is disposed on said receiving end portion,

means for moving the container along said trackway between said receiving end portion and said discharge end portion, and

mixing vane means mounted within said container for facilitating the mixing of the materials during the rotational movement of said container along said trackway, said mixing vane means including a plurality of flat blades mounted in spaced relation to the inside surface of said container outer wall, and with at least a plurality of said wall sections mounting at least one pair of said flat blades, and with the blades of each such pair being separated from each other and oppositely inclined with respect to the axial direction,

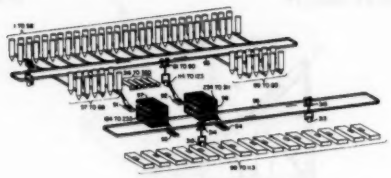
whereby the container may be filled with weighed amounts of each of plurality of different materials while positioned on said receiving end portion of said trackway, and then moved along the trackway to said discharge end portion to effect concurrent mixing and transport of the materials, and the mixed materials may be discharged upon the container reaching the discharge end portion.

4,525,071

ADDITIVE INVENTORY CONTROL, BATCHING AND DELIVERY SYSTEM

Franklin B. Horowitz, Stamford; Martin Pfeffer, Norwalk, both of Conn., and Herold T. Hertanu, New York, N.Y., assignors to Crawford & Russell, Inc., Stamford, Conn.

Filed May 31, 1984, Ser. No. 615,583
Int. Cl.³ B01F *15/04*; G05D *11/02*
U.S. Cl. 366—152 **15 Claims**



1. Apparatus for storing, dispensing, weighing, conveying and charging predetermined quantities of particulate solid ingredients selected from a plurality of different particulate solid ingredients into a plurality of batch blenders arrayed in a blending zone, comprising

a plurality of particulate solid storage bins arrayed in a storage zone, each provided with a dispensing portal opened and closed by external "open" and "close" dispensing control signals,

a trolley conveyor track extending beneath the dispensing portals in the storage zone and above the batch blenders in the blending zone,

a plurality of carriers adapted for carrying batches of particulate solids, each having code indicia displayed thereon,

a plurality of carrier holders, each movably engaged on the trolley conveyor track for travelling delivery of a carrier between the dispensing portals and the batch blenders,

carrier holder moving means for propelling each holder along the track or stopping its movement in response to received "start" and "stop" signals,

weighing means in the storage zone positioned to support a carrier while particulate solid ingredients are loaded therein through each dispensing portal, the weighing means producing a signal corresponding to the weight for the carrier and ingredients loaded therein,

means at predetermined locations for reading the code indicia on each carrier,

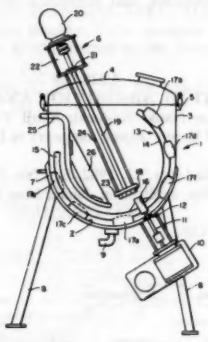
and a computer control system for receipt and execution of batch mixing receipt programs that prescribe the weights of selected ingredients, the computer control system having means responsive to the outputs of the code indicia reading means and of the weighing means, so as to produce said "start" and "stop" signals controlling the travel of one or more carrier holders for causing a carrier holder to move a carrier into juxtaposition with the dispensing portals of selected storage bins, wherein the computer control system produces said "open" dispensing control signals to dispense the selected ingredients into the carrier and so that the "close" dispensing control signal is generated when the weighing means signal reaches a value corresponding to the recipe prescribed weight for the selected ingredient, and further wherein said "start" and "stop" signals cause the carrier holder to move into juxtaposition with a selected blender after the desired ingredients have been loaded from the storage bins, so as to generate a dumping signal to cause the carrier holder to empty the contents of the carrier into the selected blender.

4,525,072

ROTARY MIXING APPARATUS

Raolo B. Giusti, London, England, assignor to T. Giusti & Son Ltd., England

Filed May 19, 1983, Ser. No. 496,058
Int. Cl.³ B01F *7/02*
U.S. Cl. 366—168 **9 Claims**



1. A rotary mixing apparatus comprising a vessel for containing the material to be processed, at least the lower portion of the vessel being hemi-spherical and having a vertical axis; a generally C-shaped part circular agitator rotatable in the vessel about an axis inclined to the vertical and about a point located in the lower region of the vessel but offset from said vertical axis, said inclined axis extending through the agitator so that the agitator has a first arm disposed on one side of the axis and a second arm disposed on the other side of the axis, said two arms being co-planar, said agitator being provided with scraper means for scraping the lower portion of the vessel and being operable to lift material to be mixed from the lower portion to an upper portion of the vessel; external drive means for said agitator located at the lower portion of said vessel; a lid hingedly disposed on the top of said vessel; and an emulsifier mounted on said lid, passing therethrough at an angle inclined

to the vertical, said emulsifier having a discharge head at the end of a drive shaft extending at said angle inclined to the vertical from the upper portion of the vessel towards the lower portion thereof, the discharge head, in use, being located adjacent the point of rotation of said agitator, whereby said lid can be hingedly opened.

4,525,073

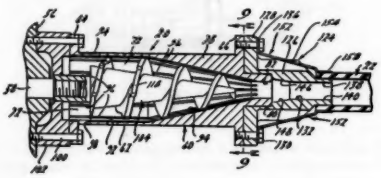
ICE MAKING APPARATUS

Joseph R. Spinner, Albert Lea, Minn., assignor to King-Seeley Thermos Company, Prospect Hts., Ill.

Division of Ser. No. 402,586, Jul. 28, 1982, Pat. No. 4,433,559. This application Jun. 21, 1983, Ser. No. 506,421

Int. Cl.³ F25C *5/14*; B01F *7/08*

U.S. Cl. 366—323 **14 Claims**



1. In combination in apparatus for producing discrete ice cubes from flake ice,

an extruder device having an extruder body defining a circular chamber having a wall having a frusto conical section and an inlet which opens into said wall,

means defining an outlet positioned at the smaller end of and axially aligned with said wall through which extruded ice may pass out of said chamber,

an ice extruding auger rotatably disposed interiorly of said chamber having a frusto conical helical ice advancing flight thereon of substantially the same diameter and length as the corresponding chamber section,

the root of said auger and said wall section providing an annular space of progressively decreasing radial extent in which flake ice passing thereinto is dewatered and compressed into a relatively solid ice mass and is forced outwardly through said outlet,

said inlet being arranged at generally right angles to the longitudinal axis of said chamber and having the center line thereof offset laterally from the rotational axis of said auger.

4,525,074

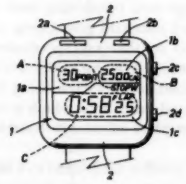
APPARATUS FOR MEASURING THE QUANTITY OF PHYSICAL EXERCISE

Tomomi Murakami, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,562

Int. Cl.³ G04B *47/00*

U.S. Cl. 368—10 **9 Claims**



1. An apparatus for measuring the quantity of physical exercise comprising:

exercise time measuring means for measuring a length of time for which the physical exercise continues;

movement detecting means responsive to movement of the body of a person taking the exercise for generating movement signals each representing the movement of the body;

exercise pace detecting means for measuring intervals between subsequent movement signals and detecting an exercise pace;

individual data storage means for storing at least the stride of the person;

judging means for making a judging as to whether movement signals exist or not;

arithmetic means for calculating the quantity of movement on the basis of the exercise time, the stride and the exercise pace; and

display means for displaying the quantity of movement thus calculated,

whereby the time measurement by said exercise time measuring means is controlled on the basis of the judgment made by said judging means.

4,525,075

ELECTRONIC WRISTWATCH WITH PRINTER FUNCTION

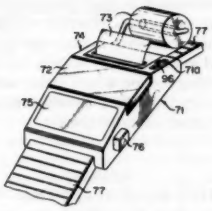
Kazunori Kita, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,660

Claims priority, application Japan, Jul. 27, 1984, 59-155380

Int. Cl.³ G04B *47/00, 45/00*

U.S. Cl. 368—10 **6 Claims**



1. An electronic wristwatch with a printer comprising:

a wristwatch case means having a recording paper loading portion;

a printing head means, arranged inside said wristwatch case, for printing on the recording paper;

an operation member means, manually operated, for moving said printing head means;

detecting means for detecting a displacement of said printing head which is performed by manual operation of said operation member; and

print controlling means for controlling the printing of said printing head at a speed corresponding to the displacement detected by said detecting means.

4,525,076

VOCAL ANNOUNCING DEVICE FOR ELECTRONIC TIMEPIECE

Katuhiko Takebe, Machida, Japan, assignor to Rhythm Watch Company Limited, Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,356

Claims priority, application Japan, Sep. 29, 1979, 54-126145

Int. Cl.³ G04B *21/08*

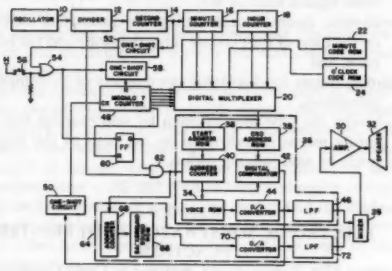
U.S. Cl. 368—63 **1 Claim**

1. A vocal announcing device for an electronic timepiece wherein background sounds are overlappingly performed with vocal announcement during vocal announcement in a timepiece with vocal announcing device which announces indi-

cated time or performs alarming action by voice signals, said device comprising:

a voice memory section which memorizes voices as digital signals;

a voice signal generating circuit which at least includes a first address counter that reads out in a fixed order a content memorized in said voice memory section and said circuit further includes a converting section which converts digital signals supplied by said voice memory section into analog signals;



a background sound memory section which memorizes background sounds as digital signals;

a background sound signal generating circuit including second address counter which reads out in a fixed order a content memorized in said background sound memory section and said circuit further includes a converting section which converts digital signals supplied by said background sound memory section into analog signal; and

action controlling section which makes said first and second address counters operate overlappingly at an optional interval or at an indicated time.

4,525,077

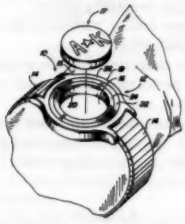
TIMEPIECE HAVING CENTRAL OPENING

Eugene N. Ketner, P.O. Box 380494, San Antonio, Tex. 78280

Continuation-in-part of Ser. No. 337,110, Jan. 5, 1982, Pat. No. 4,473,304. This application Sep. 19, 1984, Ser. No. 652,746

Int. Cl.[3] G04B *19/20, 37/00*

U.S. Cl. 368—77 **14 Claims**



1. A timepiece comprising a body having opposed faces, a central opening formed through said body which results in each of said opposed faces assuming an inner boundary which extends about and defines the configuration of said opening and an outer boundary which defines the configuration of the peripheral edge of said body; indicator means on one of said faces related to time keeping; means housed within said body by which said indicator means provides data related to the time of day, and an insert member having an outer wall surface made into a configuration which enables said insert member to be mounted within the opening.

4,525,078

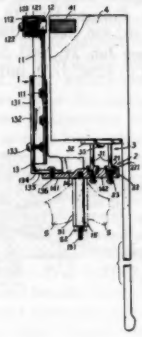
ELECTROMAGNETICALLY-INDUCED ROCKING CLOCK

Kuo-Chin Chu, 10-4 Fl., No. 62 Chang Chun Rd., Taipei, Taiwan

Filed Nov. 22, 1983, Ser. No. 554,281

Int. Cl.[3] G04B *17/02*

U.S. Cl. 368—134 **2 Claims**



1. An electromagnetically-induced rocking clock having:

an adjustable combination rod including a vertical rod fixed with a permanent magnet thereon, a L-shaped connection rod having a vertical plate connected with said vertical rod and a horizontal plate connected with a horizontal rod, and a horizontal rod fixed on a decorative figurine seat or hanging rack;

two abrasion-resistant sockets formed on said horizontal rod of said combination rod;

two supporting needles fixed on a rocking clock body or swinging casing and pivotedly mounted on said two abrasion-resistant sockets respectively; and a rocking clock body or swinging casing fixed with an induction coil corresponding to said permanent magnet to swing along two fulcra on said abrasion-resistant sockets;

said adjustable combination rod having said vertical rod formed with several positioning screw holes thereon, said L-shaped connection rod having said vertical plate formed with a series of positioning holes thereon to permit a fixing screw to pass through said positioning hole on said vertical plate and to be fixed into said positioning screw hole on said vertical rod so that said permanent magnet can be adjusted vertically along said L-shaped connection rod and having a horizontal plate formed with a series of positioning holes thereon, said horizontal rod formed with a positioning screw hole thereon to permit a fixing screw to pass through said positioning hole on said horizontal plate and fixed into said positioning screw hole on said horizontal rod so that said permanent magnet can be adjusted horizontally along said horizontal rod; said two abrasion-resistant sockets each being formed with an inversed truncated cone hole which is lowerly terminated with a bottom plate adjustably fixed on said horizontal; and

two supporting needles, connected to a base fixed under said rocking clock body, respectively pivotedly mounted on said two abrasion-resistant sockets, whereby the horizon of said clock body can be adjusted by adjusting said bottom plates of said abrasion-resistant sockets.

4,525,079
SYSTEM FOR RETAINING A WALL ON A CLOCK HOUSING

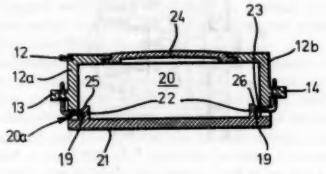
Karl W. Schmidt, Idar-Oberstein, Fed. Rep. of Germany, assignor to Gebrüder Schmidt GmbH & Co. KG, Idar-Oberstein, Fed. Rep. of Germany

Filed Jun. 22, 1983, Ser. No. 506,680

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246100

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—276 **9 Claims**



1. A clock housing comprising: a diecast or injection molded housing body of generally rectangular configuration formed with a generally rectangular opening at one side, a wall adapted to close said opening and formed with a pair of undercuts on opposite sides thereof, and a pair of spring clips are provided at opposite flanks of said housing body to reach over said opening from opposite sides thereof and engaging in respective ones of said undercuts, each of said clips being of generally U-shaped configuration having a bight reaching over said opening and a pair of shanks extending from said bight and secured to the respective flanks of said body, said body having sides along said flanks formed with notches receiving said shanks.

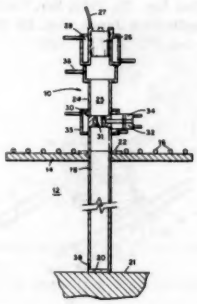
4,525,080
APPARATUS FOR ACCURATELY MEASURING HIGH TEMPERATURES

Douglas D. Smith, Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 8, 1983, Ser. No. 464,839

Int. Cl.³ G01K *3/00*

U.S. Cl. 374—115 **7 Claims**



1. A temperature sensing device for use in a high-temperature environment comprising:

an elongated blackbody sight tube penetrating into the environment;

chamber means coupled to said sight tube at a location external of said environment;

thermal radiation sensing means supported by said chamber at a location thereon remote to the coupling with the sight tube and in optical alignment with a surface at the distal end of the sight tube innermost within the environment and indicative of the temperature in the environment;

conduit means coupled to said chamber for charging said chamber with high-pressure gas; and

valve means carried by said chamber for isolating the interior of the sight tube from the pressurized gas in said chamber and the thermal radiation sensing means, said valve means being sequentially actuatable for effecting the flow of the charge of pressurized gas from said chamber through the sight tube to purge said sight tube of airborne thermal radiation attenuating material prior to measuring the temperature of said surface at the distal end of the sight tube with the thermal radiation sensing means through an opening in the actuated valve and for isolating the interior of the sight tube from said chamber and the thermal radiation sensing means between measurements of the temperature of said surface.

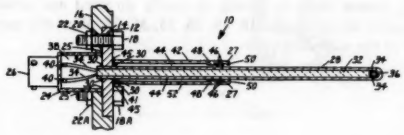
4,525,081
VIBRATION DAMPENED BEAM

Douglas C. Myhre, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 9, 1983, Ser. No. 531,218

Int. Cl.³ G01K *1/08, 1/14*

U.S. Cl. 374—208 **15 Claims**



1. A vibration dampening system for supporting an elongated temperature sensor comprising elongated temperature sensor means having an unsupported length and affixed on at least one end to a supporting structure, the supporting structure being subject to vibrations which may be transmitted to the temperature sensor means, sheath means rigidly mounted to the supporting structure at each end of the temperature sensor means which is supported on said supporting structure, the sheath means being subjected to vibrations of the supporting structure, the sheath means substantially surrounding a corresponding portion of the temperature sensor means and being spaced therefrom, elastomeric dampening means disposed between the beam means and the sheath means at each end where the temperature sensor means is to be supported to couple such end of the temperature sensor means to the supporting structure, the sensor means being supported to the supporting structure only adjacent to sheath means supported to the supporting structure, the elastomeric dampening means and the corresponding sheath means dampening vibrations of the temperature sensor means adjacent each support for the temperature sensor means to the supporting structure in direction generally perpendicular to the longitudinal axis of the elongated temperature sensor means.

4,525,082
SEALING RING ASSEMBLY FOR ROLLING BEARINGS

Manfred Brandenstein, Eussenheim; Roland Haas, Hofheim; Wolfgang Friedrich, Schweinfurt, and Rüdiger Hans, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,780

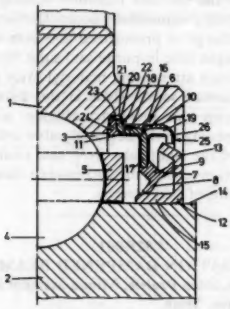
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320063

Int. Cl.³ B21D *53/10;* **F16J** *15/34*

U.S. Cl. 384—138 **10 Claims**

1. A sealing ring assembly for rolling bearings having an

outer race and an inner race and rolling elements in the gap between them, comprising a ring body **7** of elastic material bridging the gap with at least one sealing lip **8, 9** at one radial edge of said ring body in sliding contact with one of the races, a hub section **10** supported on a seating surface of the inner or outer race and a stiffening plate **16** incorporated into the ring



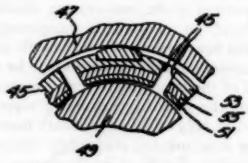
body including a radial web section and, in the hub section, a collar section connected to the outer edge of the web section facing the hub, said collar section of the stiffening plate **16** being formed both by axially inwardly directed and axially outwardly directed tabs **18, 19, 28, 35, 36, 37, 38** at the outer edge of the stiffening plate.

4,525,083

TRIMETALLIC BEARINGS

James R. Pedersen, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 297,810, Aug. 31, 1981, abandoned.
This application Sep. 21, 1983, Ser. No. 534,263
Int. Cl.³ F16C *17/06*
U.S. Cl. 384—278 **9 Claims**



1. In a flood lubricated bearing associated with a rotatable shaft, a load-bearing element for minimizing localized peak temperatures, comprising:

an inner metallic layer having a bearing face for carrying a mechanical load transmitted from an adjacent portion of said shaft to said bearing face through an intervening lubricant film;

an outer metallic layer; and

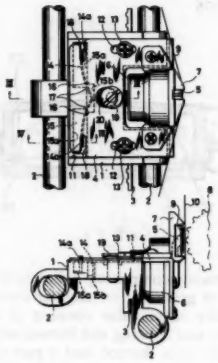
an intermediate metallic layer having higher thermal conductivity than both said inner and outer layer, respectively, said intermediate layer sandwiched between and metallurgically bonded to said inner and said outer layer and effective to maintain a substantially even temperature distribution throughout said inner layer, wherein said outer metallic layer has greater structural rigidity than both said inner and intermediate layer, respectively.

4,525,084

DEVICE FOR ADJUSTING POSITION OF PRINTING HEAD OF PRINTER

Yoshiaki Ikeda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,353
Claims priority, application Japan, Nov. 29, 1982, 57-180386
Int. Cl.³ B41J *11/20, 11/22*
U.S. Cl. 400—55 **13 Claims**



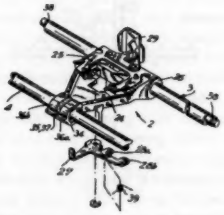
1. A device for adjusting the position of a printing head of a printer comprising: a movable carrier having an upper surface provided with a recess; a support plate of the printing head slidably mounted on the carrier upper surface for slidable movement in forward and backward directions, the support plate covering the top opening of said recess; a leaf spring disposed within said recess and having at opposite ends thereof tabs integrally projecting upwards, said tabs being in engagement with said support plate to resiliently bias said support plate in the backward direction; and means for adjustably positioning said support plate on said carrier.

4,525,085

SERIAL PRINTER

Hiroyuki Akazawa, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Division of Ser. No. 305,413, Sep. 24, 1981, Pat. No. 4,452,543.
This application Sep. 30, 1982, Ser. No. 430,420
Claims priority, application Japan, Sep. 25, 1980, 55-136236
Int. Cl.³ B41J *11/20*
U.S. Cl. 400—59 **4 Claims**



1. A serial printer comprising:

a print head for printing characters on recording sheet;

a pair of side frames, said side frames being spaced apart;

first and second guide shafts provided between said side frames of said printer;

a platen facing said print head, said platen being in a fixed position relative to said side frames, said print head strik-

ing on said platen with said recording sheet therebetween to accomplish said printing of characters;

a head carriage supporting said print head and adapted to move across said sheet, said head carriage being guided by said first and second guide shafts, said head carriage having at least one first hole, said first guide shaft passing through as said at least one first hole and sliding thereon said head carriage further including a second hole, said second hole being oval in shape and sliding on said second guide shaft,

said first guide shaft being offset, having non-concentric portions of first and second diameters, the end portions of said first guide shaft of said first diameter being rotatably engaged with said side frames, a central portion of said first guide shaft of said second diameter riding in said at least one first hole, and

an adjustment lever for varying the distance between the print head and the platen fixed to an end portion of said first guide shaft for rotation therewith, and adapted to releasably engage one said side frame adjacent to said adjustment lever, rotation of said adjustment lever and said connected end portion causing movement of said offset central portion causing said print head to move on said carriage relative to said platen,

the adjustment lever having a first end and a second end, said second end being resilient and formed with a portion projecting and biased toward said adjacent side frame, said side frame adjacent to said adjustment lever being formed with a plurality of positioning holes, said projecting portion engaging and biased into one of said positioning holes, said projecting portion being releasable from said selected positioning hole by applying a force to the first end of said lever overcoming said bias and the resilience in said second end absorbing any backlash transmitted by the guide shaft.

4,525,086

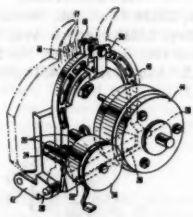
SOLENOID ACTUATED PIVOTAL PRINTER HAMMER MECHANISM

Thomas R. Field, Lexington; Frank M. Hughes, Paris; Iraj D. Shakib, and Edward J. Vitek, Jr., both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 532,121, Sep. 14, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 658,347

Int. Cl.³ B41J *1/08*

U.S. Cl. 400—144.2 **7 Claims**



1. A print mechanism for a printer comprising:

a print disc,

a hammer for impacting a preselected point on said print disc,

an electromagnetic driver for said hammer,

said hammer comprising a rigid body formed in the shape of an arch, and having contacting means attached thereto at the midpoint thereof for contacting said disc,

bearings supports formed into the legs of said arch,

impact absorbing means attached to only one of said legs of said arch to accept impact drive forces from said electromagnetic driver,

said impact absorbing means being radially displaced from said bearing supports by less than one-half the radial distance between said bearing supports and said contacting means,

the drive output of said electromagnetic driver being transferred to said hammer and said hammer being driven toward said disc solely by said driver impacting said impact absorbing means and moving through the entirety of its range of motion.

4,525,087

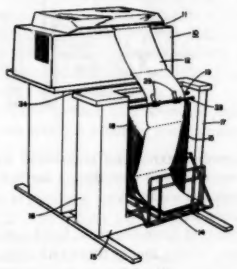
PAPER HANDLING APPARATUS WITH CONTINUOUS DRIVE ROLL AND PRESSURE FINGER

Ramon M. Cardona, Des Plaines; Theodore M. Leno, Arlington Heights, and Melody M. O'Leary, Evanston, all of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Mar. 5, 1984, Ser. No. 586,387

Int. Cl.³ B41J *11/26*

U.S. Cl. 400—613.2 **5 Claims**



1. Apparatus for handling fanfold paper exiting from a printing device, the apparatus comprising:

a support frame;

a first shaft rotatably mounted in the support frame;

a drive roller mounted on the first shaft for supporting the back surface of the paper;

means for continuously driving the first shaft at a substantially constant predetermined rotational speed;

a second shaft rotatably mounted in the support frame, located a predetermined distance away and parallel to the first shaft;

a pressure finger mounted on the second shaft, positioned opposite the drive roller;

means for applying a rotational force to the second shaft for biasing the pressure finger towards the drive roller whereby the pressure finger holds the paper against the drive roller; and

means driven by the first shaft for periodically lifting the pressure finger away from the drive roller for a predetermined period of time.

4,525,088

COMPACT ROTARY KNIFE MECHANISM

Louis E. Shipos, Ithaca, and Steven I. Tinker, Brooktondale, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 22, 1983, Ser. No. 525,203

Int. Cl.³ B41J *11/70*

U.S. Cl. 400—621 **30 Claims**

1. Mechanism for cutting across a strip of record material being moved along a path in one direction, said mechanism comprising a

support member extending transverse to the path of the strip of material, said support member having an edge against which the strip is trained,

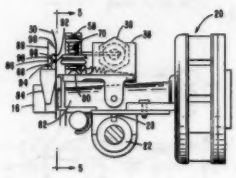
rotary cutting means,

means for carrying the rotary cutting means in transverse direction to the path of the strip of material,

cam means on said carrying means and defining an inclined surface and supporting the rotary cutting means in a non-cutting position thereof, and

means supported from the carrying means for moving the rotary cutting means from the cam means supported non-cutting position along the inclined surface to a cam means unsupported cutting position wherein the rotary cutting means engages the edge of the support member to cut the strip of material.

27. A cutoff mechanism for cutting a portion of record material from a supply thereof in a printer having a print head carriage and a print head thereon movable in transverse manner along a line of printing, the record material being moved in a path past a printer platen, said cutoff mechanism comprising a



support member extending transverse to the path of the record material and including a surface portion for bearing the record material,

rotary cutting means,

means supported from the print head carriage and carrying the rotary cutting means therewith along the line of printing, the rotary cutting means carrying means comprising a slide bracket and a slide member operable in sliding engagement therewith in a substantially straight path toward and away from the support member, and

actuating means supported from the print head carriage for moving the rotary cutting means in slidable manner toward the support member for cutting the record media along the surface portion as the print head is moved across the printer.

4,525,089

DOCUMENT FEED-IN DEVICE

Remo Falconieri, S. Giorgio Canavese, Italy, assignor to C. Olivetti & C., S.p.A., Ivrea, Italy

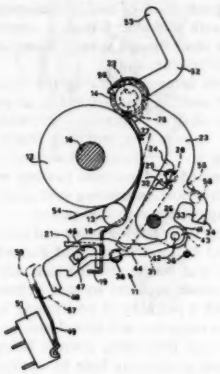
Filed Feb. 3, 1983, Ser. No. 463,493

Claims priority, application Italy, Feb. 3, 1982, 67123 A/82

Int. Cl.[3] B41J *13/02*

U.S. Cl. 400—639.1 **8 Claims**

1. A document feed-in device comprising a paper platen cylinder which defines a typing line and supports a document; a lower guide member for guiding the document towards the typing line on the paper platen cylinder; guide elements for guiding the document beyond the typing line and for holding the document in a position of fitting closely to the paper platen cylinder; a switch operable for activating rotary movement of the paper platen cylinder in such a way as to advance a top edge of document closely beyond the typing line, and wherein the guide elements permit typing in a region immediately adjacent the top edge of the document; and actuating element for moving at least a part of the guide elements away from the paper platen cylinder and connecting means operating in response to the movement of said part of the guide elements on said switch; wherein said guide elements comprise: an axis member; a series of paper pressure rolls rotatable and slidable on said axis member for cooperating with said document; two levers for supporting said axis member, wherein said two levers are movable from a first position in which the series of paper pressure rolls are adjacent the paper platen cylinder to a second position in which the series of paper pressure rolls are spaced from the paper platen cylinder to permit the document to be introduced; a bar member which is pivoted on said axis member parallel to the paper platen cylinder wherein the bar member is movable from an abutment position in which the bar member is arrested against an arrest on the two levers to a free position in which the bar member is away from said arrest; torsion spring means for holding the bar member in said abutment position against the arrest on the two levers; wherein said bar member comprises a portion for guiding the top edge of said document toward said paper pressure rolls and wherein



said portion of the bar member is parallel to the paper platen cylinder in the abutment position of said bar member and in the first position of said levers; and cam means disposed adjacent the paper platen cylinder and cooperative with the bar member for holding the bar member in the free position against the action of the torsion spring means when the two levers are positioned in said second position and wherein a lower edge of said bar member, in said free position, engages said document for urging the top edge of the document on said paper platen cylinder closely beyond the typing line when the two levers are returned from said second position to said first position.

4,525,090

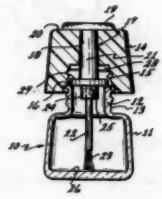
LIQUID DISPENSING BOTTLES WITH BUILT-IN APPLICATORS

Patrice J. Riley, 25038 Fourl Rd., Newhall, Calif. 91321, and Arthur W. Riley, 13218 Herrick Ave., Sylmar, Calif. 91342

Filed Oct. 3, 1983, Ser. No. 538,222

Int. Cl.[3] A46B *11/00*; **A45D** *29/20, 44/18*

U.S. Cl. 401—127 **8 Claims**



1. In a liquid dispenser including a container for liquids and a sealing member for sealing the contents of the container, the sealing member having a built-in applicator for accessing any liquids in the container normally extending into the container when said sealing member seals the contents of the container, the improvement which comprises:

said sealing member is a cap screwed onto said container and said applicator is reciprocally mounted within said cap

and axially movable therealong whereby, when said cap is in an unsealing position with respect to said container, said applicator may be reciprocated within said cap to extend back into substantially its position with respect to said container when said cap is in a sealed position with respect to said container without resealing of said container by said cap, said container being a bottle having a threaded neck and said cap including internal threads adapted to engage the threaded neck of said bottle in sealing engagement, said cap including an internal annular shoulder of a diameter greater than that of the inner diameter of said neck, said applicator including a liquid applicating portion at its lower end in said bottle and a stop member at its uppermost end extending outside of said bottle, and an intermediate section on said applicator conforming substantially to said annular shoulder and engaging the same when said cap is threaded to said bottle, said intermediate section being of an overall diameter greater than the internal diameter of said neck.

4,525,091

SCRUB SPONGE WITH OPPOSED PUNCTURE MEMBER ARMS

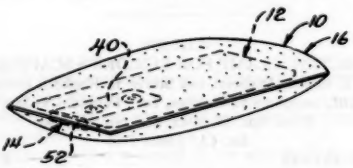
Ronald R. Van Overloop, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 25, 1983, Ser. No. 488,519

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.³ B43K *5/14*; A45D *40/26*

U.S. Cl. 401—134 **16 Claims**



1. A scrub sponge, comprising:

a packet having a rupturable wall and a closed chamber containing a liquid scrub agent;

a cover of foam material having a cavity to receive said packet and enclosing said packet; and

a puncture member intermediate said cover and the packet and having a pair of generally aligned and spaced arms on opposed sides of the packet beneath the cover, hinge means connecting said arms adjacent one end of the packet, and at least one sharp projection on one of said arms directed toward the packet to pierce the wall when the arms are pressed toward each other to release the scrub agent into the cover, and an opening extending through the other arm and aligned with the projection.

4,525,092

TUBULAR WRITING TIP HAVING AN OUTER REDUCED DIAMETER PORTION

Takahiko Shimizu; Hishao Fukui, both of Tokyo, and Tadashi Kohno, Ishioka, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00066, § 371 Date Mar. 19, 1982, § 102(e) Date Mar. 19, 1982, PCT Pub. No. WO82/03360, PCT Pub. Date Oct. 14, 1982

Continuation of Ser. No. 361,929, Mar. 19, 1982, abandoned. This PCT application Mar. 26, 1982, Ser. No. 566,970

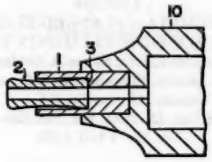
Claims priority, application Japan, Sep. 29, 1979, 54-135438[U]

Int. Cl.³ B43K *1/06, 15/00*

U.S. Cl. 401—265 **4 Claims**

1. In a writing instrument nib structure of the type including a tubular nib press-fitted into a forward end of a tubular tip of the instrument, the improvement of means for enabling press-fitting of said nib into said tip upon misalignment of the longitudinal axis of said nib and the direction of pressing by correcting such misalignment during pressing, said means comprising:

an outer nib surface defining equally configured radiused peripheral edges at opposite longitudinal ends of said nib, said outer nib surface sloping radially inwardly from said radiused peripheral edges toward a middle length portion



of said nib, thereby defining a concentrically reduced diameter central portion, such that said nib is longitudinally symmetrical between said opposite ends; and

said radiused peripheral edge at a rearward end of said nib contacting an inner surface of said tip, and said sloping surface of said nib and said inner surface of said tip defining therebetween an annular space;

whereby said sloping surface acts to guide pressing movement of said nib while correcting misalignment thereof.

4,525,093

MODULAR FRAMEWORK SYSTEM FOR FURNITURE RACKS OR SIMILAR ARTICLES

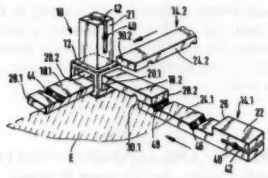
Reiner Moll, Wilhelmstrasse 19, D-7070 Schwaebisch Gmuend, Fed. Rep. of Germany, and Armin Hornung, Singen, Fed. Rep. of Germany, assignors to Reiner Moll, Schwaebisch Gmuend, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,611

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142283

Int. Cl.³ F16B *13/00*

U.S. Cl. 403—4 **4 Claims**



1. A modular framework system for use with hollow-end interconnecting tubes in building furniture or similar articles, comprising:

a connection body comprising

a block member having one upper, one lower and four side walls with two transverse through-channels of equivalent cross section traversing the side walls so as to be perpendicular to each other but not intersecting each other, and

two peg members of equivalent cross section, integrally formed with at least two of the side walls of the block member and projecting outwardly therefrom so as to be perpendicular to each other but not intersecting each other, such that each peg member is placed so as to perpendicularly abut one of said transverse through-channels; and

at least two plug members each having

an insertion plug portion adapted to fit into the hollow end portion of an interconnecting tube, and

half-plug portions of approximately half the cross section

of the insertion plugs and which are arranged at one side of a longitudinal center plane of the plug members and are adapted to fit into said channels of the block member while occupying approximately the dimensions of said channels; wherein

said at least two plug members may be selectively fitted into said channels so as to form one of an L-shaped, T-shaped and cross-shaped framework.

4,525,094

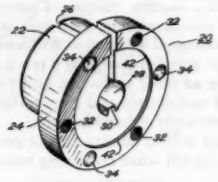
POWDERED METAL, FLANGED BUSHING FOR SECURING MACHINE ELEMENTS TO SHAFTS

James D. Johnson, Greer, S.C.; Byron B. Belden, Fletcher, N.C., and Terrence A. Kamp, Simpsonville, S.C., assignors to Reliance Electric Company, Greenville, S.C.

Filed Feb. 15, 1984, Ser. No. 580,462

Int. Cl.³ F16B *2/00*

U.S. Cl. 403—11 **16 Claims**



1. A powdered metal, flanged bushing for securing machine elements to a shift, said machine elements having a hub with a central opening, said bushing comprising a generally cylindrical, tapered body member split longitudinally and radially, and having a large end and a small end and a central bore, a flange split longitudinally and radially disposed on said large end of said body member and having a portion projecting outwardly from said large end, a key formed integrally with said body member in said central bore and projecting inwardly and axially therein, said body member having fillets at the points of junctures between said flange and said body member on both sides of said flange for increased density at said points, and a plurality of holes formed in said flange for receiving securing means for selectively securing said bushing in the opening in the hub and onto the shaft and for removing said bushing from the hub opening, the small end of said body member having an annular recess at the periphery for facilitating seating of said bushing in a hub.

4,525,095

DRIVING AND ALIGNING COUPLING

Miles P. Lamb, Colonia, and Herman S. Karol, Morris Township, Morris County, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1984, Ser. No. 623,745

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—16 **13 Claims**

1. A driving and aligning coupling, comprising: a solid shaft having a first end and outer surface, with said outer surface defining first, second and third uniformly spaced, axially extending flat bottomed keyways which start at its first end,

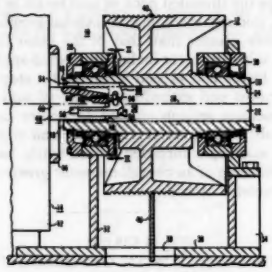
a hollow shaft having first and second ends, and an opening which extends between its ends,

said solid shaft being disposed within the opening of said hollow shaft, with said hollow shaft further including first, second and third axially extending, flat bottomed keyways in registry with the first, second and third keyways, respectively, of said solid shaft,

said keyways of one shaft being inclined and the keyways of the remaining shaft being parallel, with respect to longitudinal planes through the respective shafts,

first, second and third keys in the registering keyways, with each of said keys having a longitudinal axis and oppositely disposed longitudinally extending inclined and non-inclined flat sides corresponding to the inclined and parallel keyways, respectively,

adjustment means for independently adjusting the axial positions of said first, second and third keys to concentrically align the solid and hollow shafts,



said adjustment means including first, second and third bolts each having a threaded end engaged with a tapped opening in one of said shafts, and a head linked with a key,

bearing means for rotatably supporting the first and second ends of said hollow shaft, with said solid shaft being a driving shaft,

and a sheave fastened to said hollow shaft.

4,525,096

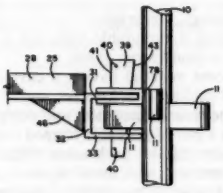
CONNECTING CLAMP FOR BUILDER'S SCAFFOLDING

Jasper L. Green, Anaheim, and Steven B. Hackett, Irvine, both of Calif., assignors to Weldtec, Inc., Fountain Valley, Calif.

Filed Apr. 18, 1983, Ser. No. 485,886

Int. Cl.³ E04G *7/00*

U.S. Cl. 403—49 **2 Claims**



1. In builders' scaffolding having an upright member, and a plurality of sockets provided thereon for coupling crossmembers thereto, said sockets having an internal clamping face, a connector means coupled to one end of said crossmembers comprising:

(a) two spaced apart limbs to permit said socket to be received therebetween with said limbs extending respectively above and below said socket;

(b) a generally trapezoidal opening having four sides, two of which are non-parallel, provided in said limbs, two of said for sides forming first and second clamping sides, said first and second clamping sides having a plurality of clamping positions,

(c) a wedge clamping member mounted for clamping engagement with said internal clamping face of said socket and selected ones of said plurality of clamping positions on said first and second clamping sides; and

(d) an abutment coupling including

(i) two spaced-apart arms for permitting at least one of said limbs to be received therebetween;

(ii) an aperture provided in said arms for permitting said

wedge clamping member to pass therethrough free of clamping action; and

(iii) an abutment face for abutting said upright member when said wedge clamping member is in pressure engagement with said first and second clamping sides and said internal clamping face of said socket;

whereby in connecting said upright member and said cross-member together said two limbs extend respectively above and below said socket, and said wedge is in pressure engagement with portions of said first and second clamping sides of said trapezoidal opening in at least one of said limbs and said internal clamping face of said socket.

4,525,097

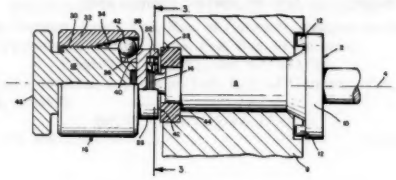
FORCE MULTIPLYING LOCKING ARRANGEMENT

Harold R. Ziegelmeyer, 5010 Griffen Creek Rd., Medford, Oreg. 97501

Continuation of Ser. No. 256,852, Apr. 23, 1981, abandoned. This application Sep. 14, 1983, Ser. No. 532,104

Int. Cl.³ E21D *20/02*

U.S. Cl. 403—259 **6 Claims**



1. In a force multiplying and locking arrangement for a device to be locked,

a main body member adapted to be mounted on the device to be locked,

a pressure member mounted on the main body member in a manner to allow longitudinal movement relative to the main body member and to prevent rotational movement relative to the main body member,

a compression member threadably moveable relative to the main body member,

first inclined plane means on the compression member,

second inclined plane means on another member,

roller means operatively disposed between the inclined plane means and engaging the pressure member,

whereby, upon threadable movement of the compression member force available at the pressure member is greatly multiplied to lock said device.

4,525,098

ASSEMBLY FOR CONNECTING TOGETHER TORQUE-TRANSMITTING MEMBERS

Werner Krude, Am Sonnenhang 10a, 5200 Siegburg-Kaldauen; Alfons Jordan, Uckerather Str. 88, 5202 Hennef, and Peter Harz, Steinbruchstr. 14, 5202 Hennef 41, all of Fed. Rep. of Germany

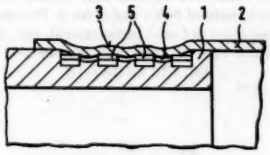
Filed Dec. 6, 1982, Ser. No. 446,955

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149596

Int. Cl.³ F16B *00/00*

U.S. Cl. 403—280 **9 Claims**

1. An assembly of parts such as shafts and the like to join together in torque-transmitting relationship a first member and a second member comprising: an inner and an outer tubular connecting part formed, respectively, on each of said first and second members arranged coaxially relative to each other with said outer connecting part being arrange circumferentially around said inner connecting part; said connecting parts being arranged to define therebetween a recess comprising an annular hollow space; a pair of projections arranged axially spaced apart on opposite sides of said recess to define the axial termination of said annular hollow space; and connecting means interposed between said connecting parts within said annular hollow space, said connecting means consisting essentially of an annular member formed separately from said inner and outer tubular connecting parts and inserted therebetween within said recess, said connecting means comprising a plural-



ity of small connecting elements having acuminated portions joined together and arranged circumferentially around said inner connecting part, said connecting elements being formed of a material harder that the material of said connecting parts and operating to penetrate the surfaces of said connecting parts to hold said first and said second members in torque-transmitting relationship.

4,525,099

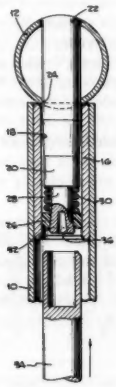
CONNECTOR FOR TUBULAR FRAME MEMBERS

Robert H. Day, Burbank, Calif., assignor to S.D.S. Industries, Inc., Los Angeles, Calif.

Filed Mar. 21, 1984, Ser. No. 591,855

Int. Cl.³ B25G *3/20;* **F16B** *2/00*

U.S. Cl. 403—371 **4 Claims**



1. A two part connector structure for frame members of a store fixture or the like:

(a) one of said parts providing an elongated substantially cylindrical bore and adapted to be attached to one of said frame members;

(b) the other of said parts comprising a pin securely attached to the another of said frame members, and projecting therefrom and adapted to be inserted into said bore, said pin having an axially extended part fitting said bore to stablize said parts against all but relative axial movement;

(c) the end of said pin being outwardly flared;

(d) an expansible compression member mounted on said pin; and

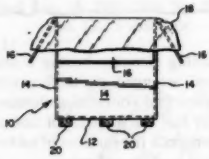
(e) a compression spring urging said compression member outwardly of said flared end firmly to grip the said bore whereby movement of said pin in an outward direction

causes said compression member more firmly to engage said bore whereby said frame members are positively locked together.

4,525,100
TRANSPORTATION AND DISPOSAL OF WASTE MATERIALS

Stanley C. Zawadzki, Jr., Ransomville; Robert A. Stadelmaier, Orchard Park, both of N.Y., and John J. Perrone, Westchester, Ohio, assignors to Cecos International, Inc., Buffalo, N.Y.

Filed Feb. 23, 1983, Ser. No. 469,041
Int. Cl.³ E02D *3/08*
U.S. Cl. 405—129 **8 Claims**



1. A method for receiving waste in the form of free flowing solids, liquids or combinations thereof from a waste source and transporting said waste to a storage station and effecting disposal thereof, said method comprising:

batch-loading said waste in a succession of transport containers, each of said containers comprising a box-like polygonal housing formed of an excess-moisture structurally vulnerable material normally having sufficient shape-wise rigidity to withstand deformation from its plan view configuration under the weight of waste placed therewithin and having the inner surfaces thereof covered by a flexible fluid-impervious material;

placing a plurality of such loaded containers in compactly nested relation upon a transport facility;

transporting said loaded containers to a designated storage station;

transferring said loaded containers to said storage station while placing them in at least one layer in which said loaded containers are in closely nested together relation; and

exposing said loaded containers in said layer to excess-moisture conditions to effect softening of said structurally vulnerable material and permit said housings and waste contents thereof to spread out and settle down, whereby to eliminate open spaces present between said loaded containers of said layer and to decrease the height of said layer.

4,525,101
DRILL STRING DEPLOYMENT OF CABLE PULLING TOOL

James W. Stevens, and Ray R. Ayers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1982, Ser. No. 394,034
Int. Cl.³ F16L *1/04*
U.S. Cl. 405—169 **7 Claims**

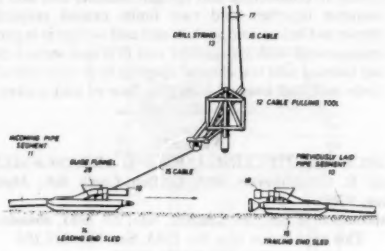
1. A method for aligning and pulling together a subsea pipeline segment and a previously installed subsea pipeline segment comprising:

providing mating alignment sleds, one sled being attached to the trailing end of the previously installed pipeline segment and the other sled being attached to the leading end of the pipeline segment to be aligned;

deploying a cable pulling tool at the end of a vertical pipe assembly suspended from a vessel;

landing the cable pulling tool on one alignment sled and thereby attaching a cable end to the sled using the cable pulling tool;

removing the cable pulling tool from the one alignment sled while paying out cable and then landing the cable pulling tool on the other alignment sled; and

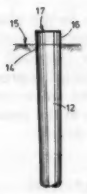


pulling the two sleds together into a mating position by means of the cable pulling tool, thereby aligning and pulling together the pipeline segment ends.

4,525,102
TIMBER PILE CONNECTION SYSTEM

Gerard J. Gillen, 4512 Ithaca St., Metairie, La. 70002

Continuation-in-part of Ser. No. 332,085, Dec. 18, 1981. This application Aug. 12, 1983, Ser. No. 522,682
The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.
Int. Cl.³ E02D *5/52*
U.S. Cl. 405—232 **10 Claims**



1. A method of driving composite timber pile sections comprising the steps of:

a. providing a pair of timber pile sections;

b. driving the first, lowermost pile section into the earth a distance leaving an exposed tip;

c. partially embedding a portion of a splice element into the one of the pile sections using a removable ram which both (1) applies force to the splice element to drive it into the first pile section and (2) defines the penetration of the splice element into the first pile section;

d. adding displaceable leveling material to the top of the first pile section;

e. laterally confining the granular leveling material with the splice element;

f. axially aligning the two pile sections;

g. partially embedding a portion of the splice element into the other pile section;

h. driving the composite pile section into the earth.

4,525,103
METHOD OF FIXATION OF ANCHORING BOLTS IN BOREHOLES

Frank Meyer, Essen; Wolfgang Cornely, Gladbeck, and Hans Mehesch, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,479

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1982, 3200201

Int. Cl.³ E21B *33/13;* **E21D** *20/02*

U.S. Cl. 405—261 **12 Claims**

1. In a method for bonding anchoring bolts in boreholes of the type in which an anchoring bolt is introduced into a twin-chamber cartridge, one chamber of which is filled with polyisocyanates and the other one with a hydroxyl component, the improvement comprising using prepolymers having viscosity below 50,000 m Pa. s from the conversion of polyisocyanates, said polyisocyanates consisting of phosgenation products from aniline formaldehyde condensates, with one or several difunctional polyols of the molecular weight range 1600-3000, as polyisocyanate component.

4,525,104
ROOF SUPPORT FOR TUNNEL EXCAVATOR

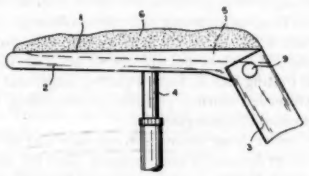
Peter Stephan, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 18, 1982, Ser. No. 442,786

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204872

Int. Cl.³ E21D *15/44, 17/01*

U.S. Cl. 405—290 **2 Claims**



1. In tunnel-excavating equipment provided with a roof support comprising a unitary horizontal shield plate supported by a jack,

the improvement wherein said shield plate has a flat solid underside and an upper surface provided with a plurality of parallel grooves extending in the direction of advance of the equipment, said grooves opening onto a rear edge of said shield plate for facilitating the removal of detritus landing on said upper surface and collecting in said grooves, said grooves progressively widening and deepening toward said rear edge, said grooves being separated by ribs tapering progressively to a width less than that of said grooves in the vicinity of said rear edge.

4,525,105
DEVICE FOR CONTROLLED BATCH FEEDING OF A FLUIDIZIBLE PARTICULATE MATERIAL AND PROCESS FOR ITS OPERATION

Ernst Jaggi, Sunde, Norway, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

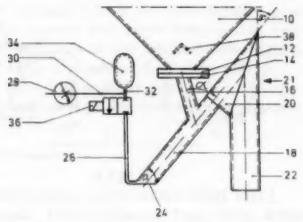
Filed Jun. 1, 1982, Ser. No. 383,554

Claims priority, application Switzerland, Jun. 15, 1981, 3911/81

Int. Cl.³ B65G *53/06*

U.S. Cl. 406—50 **23 Claims**

1. Device for controlled batch feeding of a fluidizable particulate material from a silo which comprises: a silo for storing particulate material; outlet means on said silo for discharging particulate material; a feed pipe communicating with and sloping downwardly from said silo outlet; a charge containment pipe sloping upwardly from a closed bottom end to a discharge end, said feed pipe communicating with said containment pipe intermediate its ends and forming an angle with respect to the containment pipe, said feed pipe being joined to the upper half of said containment pipe at a location which is displaced from a vertical line extending through said silo outlet means; a discharge pipe communicating with and extending downwardly



from said charge containment pipe at the discharge end of the containment pipe for discharging particulate material; and means communicating with said charge containment pipe adjacent said closed end for supplying a charge of compressed air to said charge containment pipe below said location to transfer the material from said charge containment pipe to said discharge pipe.

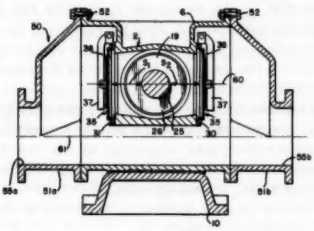
4,525,106
PNEUMATIC CONVEYING DEVICE

Louis J. DiBuo, Newringgold; Paul E. Solt, Allentown, and Marvyn L. Souders, Orefield, all of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed Dec. 13, 1983, Ser. No. 561,093

Int. Cl.³ B65G *53/48*

U.S. Cl. 406—60 **17 Claims**



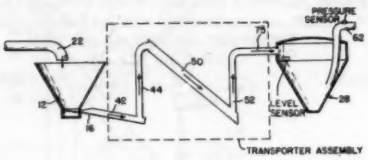
1. A line charging device for use in supplying pulverulent material to a conveying line comprising a barrel having a material inlet at one end for material to be conveyed and impeller means rotatably mounted in said barrel for transporting material from said material inlet through the barrel; said barrel having a pair of material outlets at the other end wherein said material outlets are diametrically opposed to each other; a discharge housing mounted on the said other end for receiving material from the material outlets; said discharge housing having a gas inlet on one side adapted to be connected to a source of gaseous fluid under pressure and a gas and entrained material outlet on the other side adapted to be connected to a pneumatic conveying line.

4,525,107

BARGE HAVING A PNEUMATIC LOADING AND UNLOADING SYSTEM

Robert J. C. Feldsted, 2403 Boyer Ave. East, Seattle, Wash. 98102

Filed Sep. 22, 1982, Ser. No. 421,361
Int. Cl.³ B65G *53/28*
U.S. Cl. 406—25 **25 Claims**



1. A barge, including a system for unloading cement or another dry, bulk, powdered material from the barge into a predetermined receptable, comprising:

(a) a barge hull;

(b) at least one hopper disposed in the hull to receive and to store the material;

(c) a collector system in the hull to unload the material from the hopper and to convey the material to a vacuum-pressure pneumatic conveyor, including:

(i) an air-assisted gravity conveyor disposed within each hopper to gather the material to a plurality of predetermined longitudinally spaced points in each hopper;

(ii) a suction nozzle communicating with each hopper at each predetermined point to unload the material from the hopper by vacuum suction; and

(iii) a transporter assembly connected to each nozzle to transport the material from the nozzle to a vacuum-pressure pneumatic conveyor;

wherein the transporter assembly includes:

(i) an air-assisted horizontal gravity conveyor connected to the nozzle to receive the material from the nozzle on a porous membrane defining two chambers, wherein pressurized air is introduced in the conveyor in a first chamber below the membrane and passes through the membrane into the second chamber and through the material on the membrane to fluidize the material so that the material will flow by gravity in the conveyor, yet wherein a vacuum to power the nozzle can be maintained in the second chamber above the material on the membrane; and

(ii) a vacuum lift tube connected to the gravity conveyor and communicating with a storage vessel of a vacuum-pressure pneumatic conveyor to lift the material by suction from the gravity conveyor into the storage vessel during a loading cycle.

(d) a vacuum-pressure pneumatic conveyor having:

(i) a storage vessel; and

(ii) a discharge outlet; wherein the vacuum-pressure pneumatic conveyor is disposed in the hull, is connected with the collector system, and alternately fills its storage vessel with the material in the collector during a loading cycle and discharges the material from the storage vessel through the discharge outlet during a discharge cycle;

(e) a discharge conduit connected to the discharge outlet for conveying the material from the discharge outlet to the receptacle during the discharge cycle;

(f) a source of compressed air in the hull to power the pneumatic conveyor during the discharge cycle; and

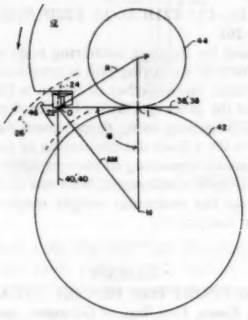
(g) a source of negative pressure in the hull to power the pneumatic conveyor during the loading cycle.

4,525,108

CUTTER AND METHOD FOR GEAR MANUFACTURE

Theodore J. Krenzer, West Rush, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,689
Int. Cl.³ B26D *1/12*; B21K *21/00*
U.S. Cl. 407—22 **2 Claims**



1. A face mill type cutter assembly for cutting a range of workgears with a continuously indexing gear cutting machine which utilizes bar stock cutting blades which include a shank portion and a cutting end portion, said shank portion in cross section having a back face, two side faces, a front face, and a fifth face forming a cutting face which defines a rake angle A with said front face, said cutting end portion having two profile surfaces and a top surface wherein one profile surface is inclined an angle B with respect to one of said side faces and intersects said cutting face to form a cutting edge, said cutting face being preserved during periodic resharpening of said cutting end portion characterized by:

a rotatable cutter head having a front face and an axis of rotation, slots formed in said rotatable head for receiving said bar stock blades, a leading edge of each of said slots intersecting said face of said rotatable head in substantial alignment with a plane which includes an angle H with a connecting line between centers of said rotatable head and a workgear within said range viewed in a pitch plane of said workgear, and said slots being inclined by an angle D with respect to the axis of rotation of said rotatable head in accordance with the equality

$$\tan |D| = \tan |A| \cdot \tan |B|$$

when said workgear within said range includes an angle H of approximately 80° to 85°.

2. A method of making a cutter assembly for cutting a range of workgears with a continuously indexing gear cutting machine using bar stock type cutting blades which include a shank portion and a cutting end portion, said shank portion in cross section having a back face, two side faces, a front face, and a fifth face forming a cutting face which defines a rake angle A with said front face, said cutting end portion having two profile surfaces and a top surface wherein one profile surface is inclined an angle B with respect to one of said side faces and intersects said cutting face to form a cutting edge, said cutting face being preserved during periodic resharpening of said cutting end portion comprising the steps of:

forming a rotatable head having an axis of rotation, and front and back faces and with slots formed through said front and back surfaces for receiving said blades,

aligning a leading edge of each of said slots with a line which includes an angle H of approximately 80° to 85° with a connecting drawn line between a center of said rotatable head and a center of one of said workgears selected from

said range when viewed in the pitch plane of said one workgear, and

inclining said slots an angle D with respect to the axis of rotation of said rotatable head in accordance with the equality

$$\tan |D| = \tan |A| \cdot \tan |B|.$$

4,525,109

CUTTING TOOL HAVING A CUTTING BLADE IN A SHANK SLOT

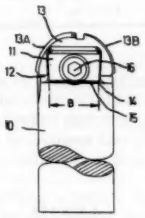
Sven O. Bylund, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jan. 9, 1984, Ser. No. 569,490

Claims priority, application Sweden, Jan. 18, 1983, 8300230

Int. Cl.[3] **B26D** *1/00, 1/12, 3/00;* **B23P** *15/28*

U.S. Cl. 407—36 **10 Claims**



1. A cutting tool for milling, boring, or turning comprising:

a shank including a slot opening axially outwardly and defined by first and second mutually facing side surfaces which are each substantially planar, and a support surface disposed adjacent an axially inner end of said slot,

said first side surface including a pair of radially spaced first contact surfaces which converge in a direction toward said second side surface, said first contact surfaces also converging in an axially inward direction,

a cutting blade seated within said slot and having a base edge supported on said support surface and including third and fourth side surfaces facing said first and second side surfaces, respectively,

said third side surface including a recess having a bottom wall and a pair of radially spaced second contact surfaces which are each substantially planar and converge toward said second side surface, said second contact surfaces converging in an axially inward direction,

said blade including an axially extending groove which opens axially inwardly at said base edge,

a clamping screw extending through a bore in one of said first and second side surfaces, and through said groove, and is threadedly mounted in the other of said first and second side surfaces to press said blade between said first and second side surfaces such that said pair of first contact surfaces are disposed within said recess and are forced against said pair of second contact surfaces to center and clamp said blade, said first side surface and said first contact surfaces being spaced from said bottom wall of said recess to form a clearance therebetween when said blade is in a clamped condition.

9. A blade for use in combination with a cutting tool of the type comprising a shank which has a slot opening axially outwardly and including first and second mutually facing side surfaces and a support surface disposed adjacent an axially inner end of said slot, said first side surface including a pair of radially spaced first contact surfaces which are substantially planar and converge at a first angle in a direction toward sid second side surface, said first contact surfaces also converging at a second angle in an axially inward direction, said blade being adapted to be seated in said slot in engagement with said support surface and comprising:

cutting edge means,

a base edge located opposite said cutting edge means and adapted to engage said support surface,

third and fourth side surfaces interconnecting said cutting edge means and said base edge and adapted to face said first and second side surfaces, respectively,

said third side surface including a recess adapted to receive said first contact surfaces, said recess having a bottom wall and a pair of radially spaced second contact surfaces which are substantially planar and converge at said first angle toward said fourth side surface, said second side surfaces converging at said second angle toward said base edge, and

a groove extending partway from said base edge surface toward said cutting edge means and being open at said base edge surface.

4,525,110

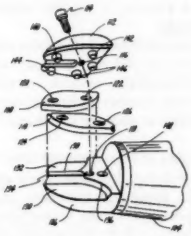
INDEXABLE BALL NOSE END MILL

Stojan Stojanovski, 1950 Birchwood, Troy, Mich. 48084

Filed May 18, 1983, Ser. No. 495,643

Int. Cl.[3] **B23C** *5/02, 5/20*

U.S. Cl. 407—40 **8 Claims**



1. An elongated ball nose end mill cutting insert having spaced planar top and bottom surfaces separated by a pair of curved elongated side surfaces, the side surfaces being joined together one to the other at opposite ends thereof, both of the side surfaces being joined to the top surface on opposite sides thereof to form a pair of opposed cutting edges, each side wall forming an angle less than 90 degrees with respect to the top surface, the top surface having a pair of similarly shaped, spaced, frusto-conical recesses disposed generally along a line passing between the ends of the insert, whereby the insert is reversible end-for-end about an axis perpendicular to the top surface.

2. The combination comprising:

an elongated tool holder having an elongated pocket open at a front end thereof, one side and a top, and having a closed side surface;

an elongated cutting insert in said pocket in a cutting position, said insert having spaced, planar top and bottom surfaces separated by side surfaces, one of said side surfaces being joined to the top surface to form a cutting edge, the top surface having first and second similarly shaped, spaced, frusto-conical recesses disposed between the ends of the insert, the insert being mounted in the tool holder pocket such that the cutting edge extends beyond the open side and front end of the pocket;

the tool holder having a third frusto-conical recess spaced from the first and second recesses in the insert on the opposite side of the closed side surface of the pocket as the first and second recesses;

a cap mounted on the holder having three frusto-conical protuberances receivable in said first, second and third recesses; and

fastening means for connecting the cap to the holder such that the protuberances are received in the recesses to cooperate to bias the insert toward the closed side of the

pocket as the cap is moved to a clamping position in which the insert is disposed between the cap and the holder.

4,525,111

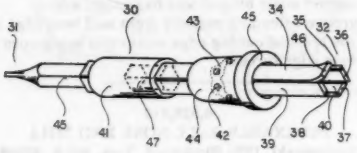
SLIDE-ON ROTARY TOOLS

Gunter E. Gutsche, 4476 Forget, St Louis de Terrebonne, Quebec, Canada J0N 1N0

Filed Sep. 27, 1982, Ser. No. 424,422

Int. Cl.³ B23B *45/00*

U.S. Cl. 408—239 A **4 Claims**



1. A rotary tool having a distal end adapted to perform a work function and a proximal end adapted to receive rotation from the shank portion of another rotary tool bit by adapting means comprising:

(a) at least two elongated members axially aligned and radially spaced on said rotary tool, said elongated members having substantially smooth outside surfaces and inside surfaces with respect to said rotary tool, said inside surfaces adapted to receive rotational forces from said shank portion,

(b) compressing means disposed about said elongated members, and adapted for generating concentric pressure between said elongated members and said shank portion, said compression means comprising a slideable member with a tapering cavity having at a first selected portion of said elongated members a greater clearance than at a second selected portion of said elongated members and

(c) friction reducing members disposed within said cavity between said slideable member and said outer surfaces, said friction reducing members for easing the sliding movement of said slideable member and for transferring concentric pressure from said slideable member to said shank portion via said elongated members, so that when said slideable member is moved from said first selected portion toward said second selected portion said concentric pressure is gradually increased.

4,525,112

MILLING MACHINE

Gottfried Blaimschein, and Otto Marzy, both of Steyr, Austria, assignors to GFM Gesellschaft für Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Filed Apr. 9, 1984, Ser. No. 598,418

Claims priority, application European Pat. Off., May 19, 1983, 83890087.6

Int. Cl.³ B23C *3/06*

U.S. Cl. 409—199 **3 Claims**

1. In a milling machine comprising

a machine bed,

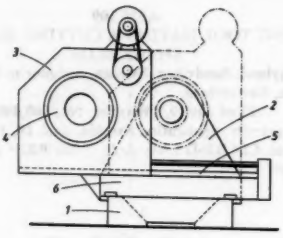
two workpiece-gripping heads spaced apart along said machine bed and defining a longitudinal axis,

track-forming means carried by said machine bed and providing at least one track which is normal to said longitudinal axis,

at least one cutter carriage, which is mounted on and slidable along said at least one track to a central position and a feed-limiting position, and

at least one internally cutting, annular milling cutter which is carried by said at least one cutter carriage and arranged to be centered on said longitudinal axis when said at least one cutter carriage is in said central position and adapted to perform a feed movement during a movement of said at least one cutter carriage from said central position to said feed-limiting position,

said at least one track has such a length that said at least one cutter carriage is slidable along said at least one track beyond said feed-limiting position to an offset tool-changing position and



said at least one milling cutter is so arranged that at least a major portion of said at least one milling cutter is disposed outside the contour at least one of said gripping heads in a view taken along said longitudinal axis when said at least one cutter carrier is in said offset tool-changing position.

4,525,113

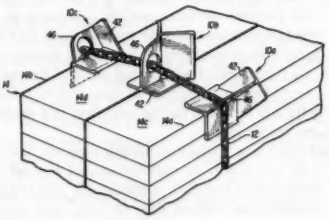
LOAD HOLDER GUARD

Joseph C. Colman, Roanoke, Va., assignor to Walker Machine and Foundry Company, Roanoke, Va.

Filed Sep. 30, 1982, Ser. No. 429,889

Int. Cl.³ B60P *7/12;* **B61D** *45/00, 49/00*

U.S. Cl. 410—41 **9 Claims**



1. A load holder having two selectively usable load engaging means for holding a load, said load holder comprising:

first load engaging means, said first load engaging means including first and second planar load engaging surfaces which intersect one another in an essentially orthogonal manner along a line of intersection;

second load engaging means, said second load engaging means comprising a surface which intersects and is orthogonal to an edge of said first and said second planar members of said first engaging members; and,

means for rigidly bridging said first engaging means and said second engaging means, said bridging means having therein means for receiving a load binding means, said load binding means being of a type which girdles said load.

6. A load holder having two selectively usable load engaging means for holding a load, said load holder comprising:

first load engaging means, said first load engaging means including first and second planar load engaging surfaces which intersect one another in an essentially orthogonal manner along a line of intersection;

second load engaging means having the shape of a sector of a hollow cylinder having a load engaging surface compris-

ing an interior surface of said sector, said load engaging surface of said second load engaging means intersecting said edges of said first and second planar surfaces of said first load engaging means; and,

means for rigidly bridging said first engaging means and said second engaging means, said bridging means having therein means for receiving a load binding means, said load binding means being a type which girdles said load.

4,525,114

FASTENER DEVICE

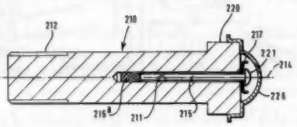
John A. B. Hirst, Wolverhampton, England, assignor to Rotabolt Limited, Dudley, England

Filed Oct. 8, 1981, Ser. No. 309,800

Claims priority, application United Kingdom, Oct. 8, 1980, 8032340; Dec. 5, 1980, 8039044

Int. Cl.³ F16B *31/02*

U.S. Cl. 411—9 **10 Claims**



1. In a device comprising a fastener formed with a screw thread and having a bore extending therein parallel to the longitudinal axis of the thread, and an elongate element in the bore, the improvement wherein one end portion of the element protrudes from the bore and there is provided means which is operative between the fastener and the opposite end portion of the element for preventing movement of said opposite end portion of the element relative to the fastener in at least one axial direction, and wherein when the fastener is in an unstressed condition a member on said one end portion of the elongate element is free to rotate about the longitudinal axis, and means operative when the fastener is subjected to a predetermined tensile stress for bringing said member into contact with the fastener thereby to prevent rotation of said member about the longitudinal axis.

4,525,115

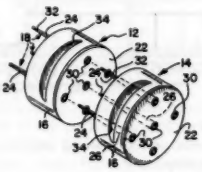
TACK SYSTEM

Ronald S. Garner, Sr., P.O. Box 545, Dayton, Ohio 45402

Filed Apr. 6, 1984, Ser. No. 597,638

Int. Cl.³ F16B *15/00*

U.S. Cl. 411—457 **8 Claims**



1. For use with bulletin boards and the like, a tack system comprising:

a first tack element having a body including upper and lower opposing faces, pin means protruding outwardly from said lower face, and said upper face having bores therein in a predetermined pattern;

a second tack element having a body including upper and lower opposing faces, and pin means protruding outwardly from said lower face of said second element in said predetermined pattern and shaped to be inserted in said bores so that said second element may be stacked on said first element; and

means for holding said second tack element against said first tack element in stacked relation.

4,525,116

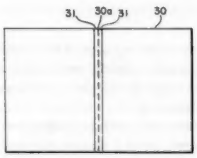
PREFABRICATED BINDABLE SHEET AND BINDING METHOD AND APPARATUS

Albert E. Holmberg, Edina, Minn., assignor to The Holmberg Company, Minneapolis, Minn.

Filed Dec. 27, 1982, Ser. No. 453,814

Int. Cl.³ B42C *9/00*; B42B *9/06, 13/00*

U.S. Cl. 412—8 **11 Claims**



7. A continuous method for producing a bound booklet of sheets of paper with printed information on the sheets wherein said sheets are formed from a sheet of paper which is double the size of the ultimate sheet size to be produced and which has a fold line extending across the center of the sheet to designate the ultimate sheet size and which double sheet also has segments of heat-responsive glue along said fold line, said method comprising,

producing printed information on said double size sheet so that two individual sheets are simultaneously printed,

folding each double size sheet along said fold line to form a double sheet assembly wherein said fold line forms the hinge connection between said two sheets with said blue segments being positioned on the outside of said folded double sheet assembly,

assembling said folded sheets with other printed sheets with the glue edges along said fold line being in registration with the edges of adjacent sheets to be bound thereto, pressing said glue edges together, and

applying heat thereto while said sheets are pressed together to activate the glue and bind sheets to said folded sheet assembly while leaving the inside of the fold line free from glue to produce a substantially unrestricted hinge connection between the individual sheets of said folded double sheet assembly within the bound booklet.

9. A prefabricated paper sheet readily bindable into a multiple page booklet and comprising,

a double size sheet,

a fold line formed across the center of said sheet to divide the same into a pair of sheets,

heat-responsive glue segments applied to said paper sheet along a binding line which forms the edge of a bound booklet when assembled with other sheets and which is readily bindable by applying heat and pressure to the glue segments of the assembled sheets,

said glue segments being applied to said sheet adjacent said fold line in a manner to expose said glue segments when the double sheet is folded along said fold line.

4,525,117

WIRE BINDING MACHINES

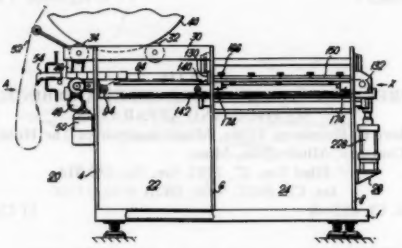
Leonard W. N. Jones, Camberley, England, assignor to James Burn Bindings Limited, Surrey, England

Filed May 17, 1983, Ser. No. 495,439

Claims priority, application United Kingdom, May 21, 1982, 8214896

Int. Cl.³ B42B *4/00, 5/00;* **B21F** *45/22, 45/00*

U.S. Cl. 412—39 **8 Claims**



1. A machine for binding a packet of perforated sheets into book form, said packet being so bound by a wire binding element closed through the aligned perforations in said packet, said machine comprising

input feed means adapted to supply a continuous length binding element from a source thereof,

cutting means adapted to cut said continuous length binding element into discrete predetermined lengths,

a feed conveyor indexed with said input feed means to deliver said continuous length element from said input feed means to said cutting means,

closing means at a closing station arranged to be fed with said discrete predetermined length elements,

stack means for supporting a stack of perforated sheets at said closing station,

translating means for moving said discrete length elements from said feed conveyor to said closing means, and

a spacing conveyor running parallel to said feed conveyor, said spacing conveyor being laterally spaced from and interposed between said feed conveyor and said closing means at said closing station, said discrete predetermined length elements being translated laterally from said feed conveyor onto said spacing conveyor, after being cut, and thereafter said discrete length elements being translated laterally from said spacing conveyor to said closing means.

4,525,118

BOOK STACKER

Raymond I. Bulka, Oak Lawn; Russell S. Ketcham, Tinley Park, and Kelvin K. Mak, Lyons, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Mar. 7, 1983, Ser. No. 473,135

Int. Cl.³ B65H *31/30*

U.S. Cl. 414—43 **13 Claims**

1. A book stacker in which books making up a partly completed preliminary stack at a halfway station are dropped from the halfway station into a second station therebeneath to come to rest atop a partly completed stack deposited the same way in the second station and comprising:

a shelf at the halfway station for collecting the books comprising the partial stack;

transfer means for feeding the books in a stream one after another to the shelf at the halfway station;

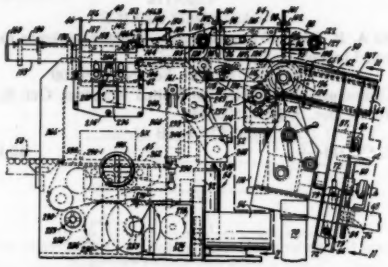
a first conveyor for delivering the books one by one to the transfer means from a lower level;

inclined frame means supporting said first conveyor in an upwardly inclined attitude to meet the transfer means;

means supporting the high end of the frame for vertical adjustment relative to said transfer means;

a normally stationary conveyor at the second station onto which the books in the preliminary stack are dropped from the shelf incidental to achieving a full vertical stack on the conveyor at the second station;

means operable in response to a countdown of books in the preliminary stack for removing the shelf from beneath the preliminary stack after the preliminary stack has been completed;



means operable in response to the achievement of a full stack for operating the conveyor at the second station to deliver to a third station the complete stack of books;

said transfer means including a high speed feed belt driven at a higher speed compared to said first conveyor, said high speed feed belt being interposed between said transfer means and the exit end of said first conveyor to accelerate a book from the conveyor to the transfer means,

means resiliently supporting the conveyor at the second station to cushion the falling weight of a preliminary stack of books.

4,525,119

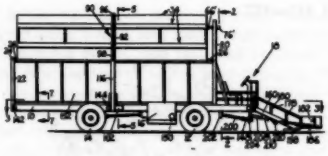
APPARATUS FOR COLLECTING AND UNLOADING HAY BALES AND THE LIKE

Frank Cawrse, 35930 Providence School Rd., Lebanon, Oreg. 97355; George F. Cawrse, 38770 Hungry Hill Rd., Scio, Oreg. 97364, and Frank W. Cawrse, 35930 Providence School Rd., Lebanon, Oreg. 97355

Continuation of Ser. No. 65,363, Aug. 9, 1979, abandoned. This application Feb. 16, 1984, Ser. No. 580,841

Int. Cl.³ A01D *87/12;* **B60P** *1/00*

U.S. Cl. 414—111 **6 Claims**



1. In apparatus for collecting and unloading hay bales and like objects, and comprising:

(a) a mobile vehicle frame,

(b) an elongated framework mounted longitudinally on the vehicle frame for rotation on a horizontal axis,

(c) the framework defining a plurality of longitudinally extending, circumferentially spaced peripheral compartments,

(d) feed conveyor means on the vehicle frame extending longitudinally of and below the rotary framework for registration with each peripheral compartment selectively upon rotation of the framework,

(e) feed conveyor drive means interengaging the vehicle frame and feed conveyor means for moving the later,

(f) shield means mounted on the vehicle frame and extending arcuately upward from opposite sides of the feed conveyor means for enclosing the lower half of the framework for preventing gravity removal of hay bales and the like as the compartments traverse the lower half of rotation of the framework, and

(g) framework drive means interengaging the vehicle frame and framework for rotating the latter stepwise to register each peripheral compartment selectively with the feed conveyor means, the drive means comprising:

(1) an annular ring secured to and encircling the framework centrally of the longitudinal ends thereof and including an outwardly facing annular guide groove having a substantially smooth surface,

(2) an endless flexible drive chain received freely in the guide groove in frictional engagement with the surface thereof,

(3) tightener means on the frame engaging the flexible drive chain for tightening the latter into frictional driving engagement with the surface of the guide groove, and

(4) rotary drive means mounted on the vehicle frame outwardly of the shield means and engaging the drive chain for driving the chain and rotating the framework,

(h) the shield means having an opening therethrough for passage of the drive chain between the annular ring and rotary drive means.

4,525,120

METHOD OF AND APPARATUS FOR CONTROLLABLY CHARGING A FURNACE

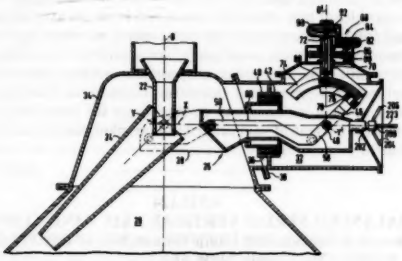
Edouard Legille, Luxembourg, and Pierre Mailliet, Howald, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Jul. 31, 1981, Ser. No. 288,974

Claims priority, application Luxembourg, Apr. 3, 1981, 83280

Int. Cl.³ F27B *1/20*

U.S. Cl. 414—160 **48 Claims**



8. Apparatus for steering an elongated tubular member positioned within an enclosure, the tubular member having a first longitudinal axis, said apparatus comprising:

suspension fork means, said fork means being rotatably supported in a wall of the enclosure, said fork means including an elongated body portion having a second longitudinal axis, said fork means further including at least a first pair of parallel branches extending from one end of said body portion;

means for pivotally mounting the tubular member adjacent a first end thereof between the branches of said fork means first pair of parallel branches, said mounting means defining a third axis about which the tubular member may pivot, said third axis being transverse to the first longitudinal axis of the tubular member;

control means, said control means being positioned to the exterior of the enclosure, said control means having a fourth longitudinal axis;

pivot means, said pivot means including a rotatable shaft which is engaged by said control means adjacent a first end of said control means, said pivot means shaft defining a fifth axis which is transverse to said fourth axis;

means for imparting motion to said control means at a point displaced from said pivot means to cause said fourth longitudinal axis of said control means to undergo a pattern of movement which it is desired to have the first longitudinal axis of the tubular member follow;

motion transmission means, said motion transmission means extending through said fork means for coupling rotational motion of said control means fourth axis about said pivot means shaft defined fifth axis to the tubular member to thereby cause the tubular member to rotate about said third axis; and

means connecting said pivot means to said fork means whereby rotation of said control means fourth axis about a point of intersection of said fourth and fifth axes is converted into rotation of said fork means about said second longitudinal axis and simultaneous rotation of the tubular member with said means for pivotally mounting the tubular member;

said control means comprising:

rotatable means mounted on said pivot means shaft for rotation therewith, said rotatable means including a driven gear portion;

bracket means, said bracket means supporting said pivot means, said bracket means being rotatable about said fourth axis;

first coupling means for coupling said rotatable means to said fork means, said coupling means including a rotatable connection;

means for imparting rotation to said bracket means whereby said rotatable means and said bracket means may be rotated about said fourth axis; and

means engaging said driven gear portion of said rotatable means for driving said rotatable means independently of the rotation thereof about said fourth axis, said driving means causing rotation of said pivot means shaft and said first coupling means about said fifth axis.

4,525,121

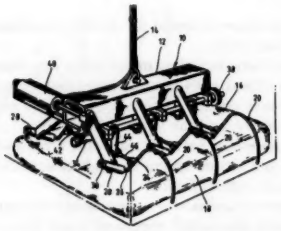
APPARATUS FOR PICKING UP, CARRYING AND RELEASING ARTICLES

Wesley D. Cawley, 721 Grigsby Dr., Port Neches, Tex. 77651

Filed Mar. 26, 1984, Ser. No. 593,212

Int. Cl.³ B66C *1/59*

U.S. Cl. 414—564 **7 Claims**



1. An apparatus for picking up, carrying and releasing articles comprising,

a support body,

at least one grasping finger on opposite sides of the support body, said fingers shaped in the form of an arc of a circle,

an arm supporting each of the fingers, said arms having first and second ends, the first end of each arm connected to one end of each finger, the first end of each arm being positioned at an angle to the plane of the supported finger, the second end of each arm being at an angle to the first end of the arm,

said second ends of the arms being rotationally supported from the support body, and

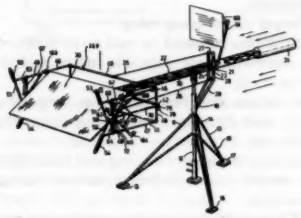
lever arms connected between the support body and the first end of each arm for rotating said first end about the second end whereby the first end of each arm and said fingers follow a circular path for grasping and releasing articles.

4,525,122

WIND-POWERED MACHINE

Ondrej Krnac, 311 Dixon Rd. No. 1007, Weston, Ontario, Canada M9R 1S3

Filed Jul. 18, 1983, Ser. No. 514,867
Int. Cl.³ F03D *5/06*
U.S. Cl. 416—80 **7 Claims**



1. A wind power-generating machine which comprises:

a vane frame and at least one power vane;

vane support means comprising an elongate truss;

tower means for supporting said vane support means;

power actuating means reciprocally movable in response to movement of said power vane;

said power vane being reversibly pivotally mounted in said frame on said elongate truss adjacent a first end thereof for movement about a substantially horizontal axis through a predetermined arc;

said elongate truss being rotatably mounted on said tower means for first movement about a horizontal axis through a predetermined arc in response to vertical movement of said power vane and in a second direction about a vertical axis in response to horizontal movement of said power vane;

a vertical frame mounted for pivotal movement relative to said vane frame,

said vane frame including upper and lower vane arms having spring closed jaws at their outer ends, upper and lower bell cranks connected between the upper and lower jaws, respectively, and the vertical frame;

first spring means between said vane arms and said vertical frame and second spring means between said power vane and said vertical frame;

stop means on said power vane adapted to engage said upper and lower jaws at the upper and lower limits, respectively, of arcuate travel of said power vane,

said jaws being operable by rotation of their respective bell cranks at said upper and lower limits and initiating reversal of the direction of arcuate travel of the power vane through said second spring means; and

a governor means for controlling movement of said power vane,

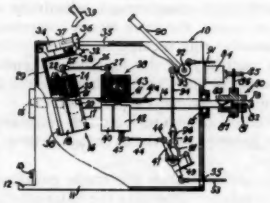
said governor means comprising an arm pivotally mounted on said elongate truss, a governor vane movably mounted on said arm and a cable connecting said governor arm to said upper and lower vane arms.

4,525,123

ROTARY WING AIRCRAFT

Alfred Curci, 183 London Dr., Hamden, Conn. 06514

Filed May 6, 1982, Ser. No. 375,763
Int. Cl.³ B64C *11/30*
U.S. Cl. 416—115 **12 Claims**



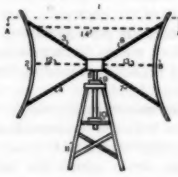
1. In a helicopter, the combination with a power shaft having a main axis and bearings for supporting an even number of blades for individual pivoting about their longitudinal axes, arms mounted with one end on said blades, respectively, for pivoting the latter in the same and opposite directions for cyclic and total pitch control, respectively, of a control lever mounted intermediate its ends on a first pivot with a first axis which lies in a first plane in which said main axis lies, with said control lever having movability of first and second kinds bodily with its pivot axis in said plane and rockable about its pivot axis, respectively, links connecting the opposite ends of said control lever with the other ends of said arms for pivoting said blades in first and second directions on movements of said control lever of said first and second kinds, respectively, an axially immovable control shaft turning with the power shaft and having a universal bearing, a swashplate mounted on said universal bearing and turning with the control shaft, a first operating connection between said swashplate and first pivot, and including a follower member slidable on said control shaft and in follower relation with the swashplate, to impart to said control lever movement of one of said kinds on axial motion of said follower member, a manual control member operatively connected with the swashplate and operable for shifting the latter into any of its universal positions, another manual control member, a second operative connection between said other control member and control lever for imparting to the latter movement of said other kind on manipulating said other control member.

4,525,124

BALANCED STRESS VERTICAL AXIS WIND TURBINE

Thomas A. Watson, and Philip Watson, both of Box 173 Stn. A, Rexdale Ont, Canada M9W 5L1

Continuation-in-part of Ser. No. 385,883, Jun. 7, 1982, abandoned. This application May 13, 1983, Ser. No. 494,295
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—132 B **9 Claims**



1. A vertical axis wind turbine comprising a shaft mounted for rotation about a vertical axis, diagonal radial arms connected in pairs to the shaft and angularly spaced about the shaft, each pair of arms arranged to diverge as they extend

outward from the shaft, each pair of arms have connected to its outer ends an airfoil, the airfoil curved and mounted vertically with its ends pointing away from the shaft; wherein upon rotation a vertical outward force vector is developed in the airfoil, also a vertical inward force vector is developed by the pull in the diagonal arms which is superimposed upon the airfoil, the airfoil and the diagonal arm's parameters are set so that the inward and the outward vertical forces on the airfoil substantially counterbalance each other.

4,525,125

PRESSURE RESPONSIVE PUMP CONTROL SYSTEM HAVING AN ALARM LAMP

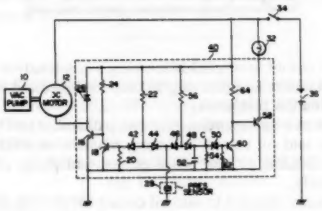
Akio Matsumoto, Kanzaki, and Mitsuyoshi Yokota, Ibo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,760

Claims priority, application Japan, Dec. 10, 1982, 57-187803[U]

Int. Cl.³ F04B *49/06, 21/00;* **G08B** *21/00*

U.S. Cl. 417—44 **6 Claims**



1. A pump control system comprising a DC motor, a pump driven by said DC motor to generate and supply a pressure to a container, a single pressure sensor for sensing a pressure within said container controlled by said pump, and being operative with a predetermined pressure within said container, a first circuit means responsive to the operation of said single pressure sensor to drive said DC motor, a timing, circuit controlled in response to the operation of said single pressure sensor, an alarm lamp, and a circuit means responsive to an output from said timing circuit means to control the turn-on and -off of said alarm lamp whereby said single pressure sensor provides the sole means for controlling said pump and said alarm lamp.

4,525,126

ELECTRO-HYDRAULIC UNIT FOR STEERING, BRAKING, SUSPENSION AND LIKE DEVICES FOR VEHICLES

Roger Laumont, La Varenne St Hilaire, France, assignor to Hydroperfect International H. P. I., Chennevieres, France

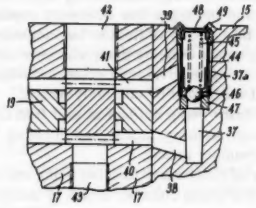
Filed Mar. 3, 1983, Ser. No. 471,746

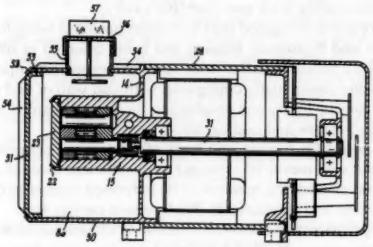
Claims priority, application France, Mar. 4, 1982, 82 03619

Int. Cl.³ F04B *47/08;* **F04C** *13/00;* **B60R** *16/08;* **B62D** *5/06*

U.S. Cl. 417—310 **9 Claims**

1. An electro-hydraulic unit for control devices of vehicles, comprising an electric motor and a hydraulic pump of the gear type, said electric motor having a driving shaft and said hydraulic pump having a driven shaft with said hydraulic pump being driven by the driving shaft of said electric motor and connected to said electric motor, said electric motor and said hydraulic pump having a common interface portion constituting a lateral cheek for said electric motor, and said common interface portion delimiting further a body for said hydraulic pump and having an inner stepped bore, a bearing for supporting said driving shaft of said electric motor, a sealing member surrounding said driving shaft of said electric motor, said bearing and sealing member located in two stepped contiguous portions of said stepped bore, a connecting nut located in a third stepped portion of said stepped bore for connection of said driving shaft of said electric motor with the driven shaft of said hydraulic pump, said common interface portion having





further a recessed bore and channels connecting inlet and outlet ducts of said hydraulic pump with an overpressure valve located in said recessed bore for control of pressure of the outlet of said pump.

4,525,127

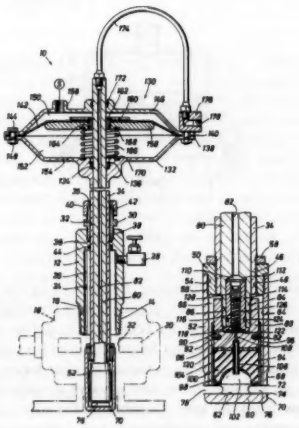
FLUID PUMP MECHANISM

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jan. 5, 1981, Ser. No. 222,362

Int. Cl.³ F04B *43/06*

U.S. Cl. 417—479 **9 Claims**



1. A pump mechanism for pumping measured quantities of fluid, said pump mechanism comprising:

(a) body means adapted to support said pump mechanism

and defining an internal receptacle open at one extremity thereof;

(b) probe means extending in movable sealed relation through said body means, said probe means defining flow passage means;

(c) transducer housing means being supported by said probe means and having a free extremity capable of being extended into a body of fluid to be pumped, said transducer housing means defining pump chamber means therein and further being receivable in protected relation within said internal receptacle of said body means;

(d) wall means being defined at said free extremity of said transducer housing means and forming a wall of said pump chamber means;

(e) a body of elastomeric material being movably positioned within said pump chamber means of said probe means and defining a pumping cavity opening toward said wall means, said body of elastomeric material further defining pumping passage means extending therethrough and communicating with said pumping cavity;

(f) opposed elongated inlet and outlet openings being formed in said transducer housing and being oriented in substantially parallel relation with said wall means, said openings being substantially contiguous with said wall of said pump chamber means and conducting fluid to be pumped to said wall means and said cavity;

(g) means for forcing said body of elastomeric material and said wall means into contact with sufficient force to cause said elastomeric material to be deformed against said wall means and substantially displace said cavity; and

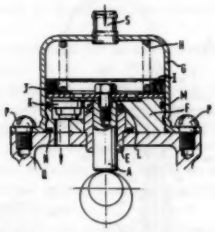
(h) pressure activated valve means in communication with said passage means for allowing unidirectional flow of said fluid from said cavity through said probe means in response to fluid pressure generated upon displacement of said cavity.

4,525,128

RECIPROCATING EXHAUSTER

John S. Thistleton, Lincoln, England, assignor to Clayton Dewandre Co., Ltd., Lincoln, England

Filed Jun. 9, 1983, Ser. No. 502,839
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—550 **7 Claims**



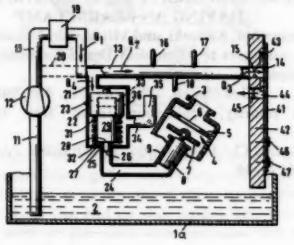
1. A reciprocating exhauster for mounting on an engine casing to be driven by the engine and comprising a pump member working in a cylinder body so as to define on opposite sides thereof an inlet chamber having an inlet for connection to a vacuum reservoir, and an exhaust chamber having an outlet fitted with an exhaust valve, and a valve arranged to permit fluid to flow from the inlet chamber to the exhaust chamber, the pump member and cylinder body being shaped to minimize the clearance volume of the exhaust chamber wherein the clearance volume of said exhaust chamber is substantially less than the clearance volume of said inlet chamber.

4,525,129

OIL-SEALED VACUUM PUMP

Hanns-Peter Berges; Peter Frieden, both of Cologne, and Wolfgang Leier, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,424
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3150000
Int. Cl.³ F01C *21/04*; F04C *27/02, 25/02*
U.S. Cl. 418—84 **10 Claims**



1. An oil circuit arrangement forming a combination with an oil-sealed vacuum pump having a pump chamber and bearings, said combination comprising:

(a) an oil circuit for supplying said pump chamber and bearings with oil, said oil circuit including first and second branch conduits leading to said bearings and said pump chamber, respectively;

(b) an oil pump coupled to said oil circuit for driving oil therethrough;

(c) valve means coupled to said oil circuit for shutting off oil supply to said pump chamber during standstill of said vacuum pump; and

(d) pressure reducing means coupled to said oil circuit for reducing the oil pressure to atmospheric pressure; said first branch conduit leading to said bearings being situated upstream of, and said second branch conduit leading to said pump chamber and said valve means being situated downstream of said pressure reducing means as viewed in the direction of oil flow in said oil circuit for supplying said pump chamber with oil at atmospheric pressure and for supplying said bearings with oil at higher-than-atmospheric pressure.

4,525,130

ADJUSTABLE MOLDING FRAME

Frederick P. Netznik, 8556 Central Park Ave., Skokie, Ill. 60076

Filed May 7, 1984, Ser. No. 607,933
Int. Cl.³ B29D *27/00*
U.S. Cl. 425—2 **18 Claims**

1. Apparatus for providing a support surface uniquely contoured and configured to a person seated thereon, said apparatus comprising:

a support structure;

a seat pan positioned on said support structure;

a back panel coupled to said seat pan;

first and second pliable, sealed containers positioned respectively on said seat pan and said back panel;

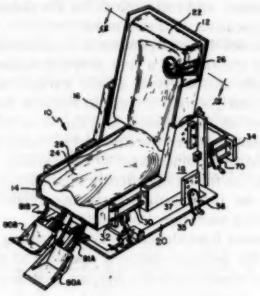
a deformable material located in said first and second sealed containers;

first and second vacuum pumps coupled respectively to said first and second sealed containers for the evacuation thereof when a person is positioned thereon;

first control means coupling said seat pan and said back panel for adjusting the length of said seat pan in accordance with the dimensions of the person thereon;

second control means coupling said seat pan and said back

panel for adjusting the angle therebetween in accordance with the orientation of the person thereon; and



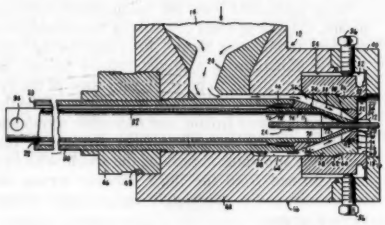
third control means coupling said support structure and said seat pan for rotating said apparatus rearward in orienting the back panel thereof generally horizontally with said person supported primarily thereon.

4,525,131

CABLE-COATING EXTRUDER HEAD SYSTEM WITH CHANGEABLE DIE AND GUIDER ELEMENTS

Henry W. Hauser, Jr., Antes Fort, Pa., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Aug. 29, 1983, Ser. No. 526,962
Int. Cl.³ B29C *30/14*
U.S. Cl. 425—114 **11 Claims**



1. Extruder head apparatus for coating a longitudinally advancing cable with a layer of a fluent coating material, comprising

(a) an extruder head body having a rearward end, a forward end, a central passageway extending between the ends and arranged for substantially axial advance of the cable therethrough, and a lateral passageway for delivering the coating material under pressure to the central passageway from a locality outside the head body;

(b) a die extending across the central passageway at said forward end and defining a die aperture disposed and dimensioned for advance of the cable with clearance therethrough from the central passageway; and

(c) guider means mounted within the central passageway rearwardly of the die for centering the cable in the die aperture, said guider means having an annular lip for closely surrounding the cable adjacent the die and cooperating with the die to define an annular gap around the cable, said guider means further cooperating with the head body to define a passage for conducting the coating material from the lateral passageway through the gap into contact with the cable to apply thereto a coating material layer having a thickness determined by the clearance between the die and the cable;

(d) said guider means including

(i) a generally annular guider body fixedly mounted in said central passageway, extending forwardly of said lateral passageway, and having an internal opening constituting the narrowest constriction within the central passageway rearwardly of the die, and

(ii) a guider insert including said lip, removably received in and detachably engaged by said guider body and extractable and insertable through said rearward end, said guider insert further including an extension projecting rearwardly beyond said rearward end when the guider insert is received in said guider body as aforesaid for manipulation to disengage and extract the guider insert, the guider body and the guider insert being mutually arranged to permit advance of the cable through the central passageway; and

(e) said die including

(i) a die body fixedly mounted in said head body at said forward end, defining a die seat in register with said internal opening, and

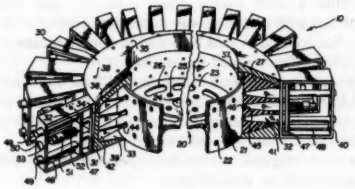
(ii) a female die insert removably received in said die seat and defining said die aperture, said die insert and said die seat being mutually shaped to permit rearward removal of the die insert from the die seat and forward insertion of the die insert into the die seat while preventing forward displacement of the die insert beyond the die seat, said die insert having a maximum external transverse dimension sufficiently small to enable the die insert to pass through said internal opening such that the die insert is extractable and insertable through said rearward end when said guider insert is extracted from said guider body.

4,525,132

MACHINE FOR MOLDING AND CURING A MASS OF RESILIENT MATERIAL

Rulon A. Williams, 3138 Jean St., Magna, Utah 84044

Filed Nov. 4, 1983, Ser. No. 548,668
Int. Cl.³ B29H *5/02;* **B29C** *5/00*
U.S. Cl. 425—117 **1 Claim**



1. A machine for molding and curing a mass of resilient material into a desired shape in one operation and bonding the resilient material to an insert material in the same operation, said machine comprises: a mold having a cavity surrounded by a series of fin compressor box means each having a plurality of fins operable to extend inwardly into said mold cavity and upon completion of the curing process of the resilient material to be withdrawn from said mold cavity to permit easy removal of the finished product from said mold cavity, said mold having a closure top; compensating spring means in the fin box means for allowing a variance in the movement of the fins; and air escape holes in said mold cavity wall to allow air in said mold cavity to be ejected therefrom; each of said fins comprising a fin body having a recess in the inner end, a fin spring in said recess, a retractable shaft in said recess, a retainer O ring on said shaft, and a rim seal on said shaft, said retractable shafted being telescope into said recess of said fin body when the rim seal in tandem with the retractable shaft is pushed against and meets resistance against a section of said mold cavity wall as the fins are actuated into said mold cavity, actuating means for telescoping said fins resulting in a larger mass of fin bodies displacing a smaller mass of retractable shafts within said closed mold cavity after said mold cavity is

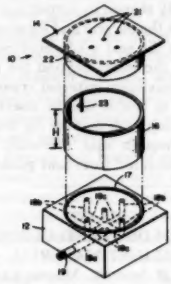
filled with said resilient material whereby excess air is forcably ejected from said mold cavity permitting the resilient material to fill the voids in said mold cavity from the pressure caused by said displacing fin bodies; each said fin body further having an air passage therethrough in its outer end so that air circulates freely through said fin bodies to avoid the build-up of a differential pressure therein that would hinder the intended movement of the fins and so that a fluid of a controlled temperature can be circulated through said air passage to aid in heating and cooling the resilient material to be cured.

4,525,133

APPARATUS FOR PACKAGING ARTICLES

Conrad E. Bergmann, 1365 Lincoln Ave., San Jose, Calif. 95125

Filed Sep. 29, 1982, Ser. No. 427,695
Int. Cl.³ B29D *27/00*
U.S. Cl. 425—120 **10 Claims**



1. A packaging system for encapsulating an article within a solid plastic foam material comprising:

(a) a base adapted to support an article to be encapsulated within a solid plastic foam material, said base being formed with a passageway in communication with an inlet orifice formed in said base and in communication with an outlet orifice formed in said base;

(b) a wall enclosure disposed on said base and surrounding the area adapted to support the article on said base, said wall enclosure being disposed to form a mold cavity in communication with said outlet orifice;

(c) a cover disposed across the upper end of said wall enclosure above the article; and

(d) means introducing an expandable plastic foam material in liquid form into said inlet orifice, said expandable plastic material in liquid form advances through said passageway and is discharged from said outlet orifice into the space defined by said wall enclosure, said cover and said base for encapsulating the article within the plastic foam material in liquid form, said plastic foam material in liquid form solidifies into a solid plastic foam material for packaging the article within the solid plastic foam material.

4,525,134

APPARATUS FOR MAKING A MULTI-LAYER INJECTION BLOW MOLDED CONTAINER

Robert J. McHenry, St. Charles, and Martin A. Ryan, Geneva, both of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 59,375, Jul. 20, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 324,824
Int. Cl.³ B29D *23/02;* **B29F** *1/06, 1/10*
U.S. Cl. 425—130 **18 Claims**

1. Apparatus for making a multi-layer rigid article, comprising:

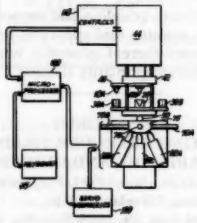
(A) an injection mold and a core pin which together define a cavity for molding a parison having a bottom portion, the cavity having an entrance at the bottom portion of the parison,

(1) an injection nozzle having an exit communicative with the entrance, a flow path for each of three polymer streams, and exit orifices for the polymer streams communicative with said nozzle exit,

(2) means for independently commencing in the nozzle exit the flow of a first polymer stream to become the inside surface layer of the parison and the flow of a second polymer stream to become the outside surface layer of the parison, and the flow of a third polymer stream between the first and second polymer streams to become an inner layer of the parison,

(3) means for independently controlling the flow of each of the three polymer streams relative to each other during each injection cycle,

(4) means for independently terminating the flow of each of the polymer streams, operable to terminate each or any of said polymer streams independently of one another and at predetermined including differing times during each injection cycle,



(5) means associated with the independent commencing means, the independent controlling means and the independent terminating means, for coordinating their respective functions in a predetermined manner during the injection cycle, to permit termination of the flow of the first polymer stream, then termination of the flow of the third polymer stream, and thereafter termination of the flow of the second polymer stream, to thereby enable the apparatus to provide the article with an inner layer formed from the third polymer stream that is continuous and is completely encapsulated within the surface layers,

(b) means for transferring the injection molded parison to a blow molding cavity having the configuration of the article,

(C) means for inflating the parison in the blow molding cavity to form the article.

4,525,135

APPARATUS FOR MOLDING AND PERFORATING A FRP SHEET

Alexandre Forestier, Vaux le Penil; Alain A. Pluquet, Melun; Roger A. Rosa, Morangis; Mansour Tabet, Melun, and Pierre M. Teysseyre, Juvisy sur Orge, all of France, assignors to S.N.E.C.M.A., Paris, France

Division of Ser. No. 342,733, Jan. 26, 1982, Pat. No. 4,449,607. This application Jan. 26, 1984, Ser. No. 574,166
Claims priority, application France, Jan. 29, 1981, 81 01670
Int. Cl.³ B29C *1/14, 17/14*
U.S. Cl. 425—290 **4 Claims**

1. Apparatus for molding a perforated panel having tubular protrusions surrounding the perforations on one side of each panel, said apparatus comprising:

(a) a fixed mold part comprising:

(i) a first cooling plate assembly in which a water circulation cavity is formed;

(ii) a molding form which rests on said first cooling plate assembly, said molding form having a plurality of cylin-

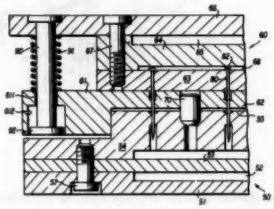
drical recesses in the working face thereof and through holes therethrough which are concentric with said cylindrical recesses; and

(iii) first means for assembling said first cooling plate assembly and said molding form and

(b) a movable mold part comprising:

(i) a second cooling plate assembly in which a water circulation cavity is formed;

(ii) a pin support plate resting on said second cooling plate assembly, a plurality of pins being mounted in said pin support plate, said pins being sized, shaped, and positioned so that, when the apparatus is in use, each one of said pins extends through a corresponding one of said cylindrical recesses and into a corresponding one of said through holes;



(iii) a molding counterform which rests on said pin support plate; and

(iv) second means for assembling said second cooling plate assembly and said pin support plate,

whereby, during use of the apparatus to mold a panel from a roughcast comprising a stack of precut layers of preimpregnated mat comprising glass felt having short fibers of glass held together by epoxy resin, said movable mold part is closed over said fixed mold part to define a molding cast therebetween and said plurality of pins pass through the roughcast, pushing aside the glass fibers and forcing them into said plurality of cylindrical recesses, after which said pins enter said through holes, whereby a perforated panel having tubular protrusions surrounding the perforations on one side of the panel is formed.

4,525,136

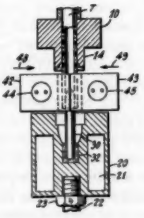
APPLICATION FOR FORMING A PLASTIC TUBE COUPLING

William W. Rowley, 11524 Wilbert Rd., Chardon, Ohio 44024

Division of Ser. No. 338,308, Jan. 11, 1982, Pat. No. 4,446,084. This application Nov. 30, 1983, Ser. No. 556,395

Int. Cl.³ B29C *24/00, 17/00*

U.S. Cl. 425—384 **6 Claims**



1. A two parts mold for reforming plastic tube ends comprising two separable mold parts, one of which has a hole therethrough, such tube ends projecting one at a time axially through said one of the mold parts toward the other of the mold parts, a pin corresponding to the internal diameter of such tube ends mounted on and projecting axially from the other of the mold parts and entering the tube end when inserted through said one of said mold parts means to heat said pin thus to heat such tube end from the interior thereof before the mold parts are closed and means to insulate said pin from the other of the mold parts.

4,525,137

LIQUID FUEL COMBUSTION DEVICE

Mitsuharu Tomioka, Kashihara, and Mitsuhiro Imajima, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

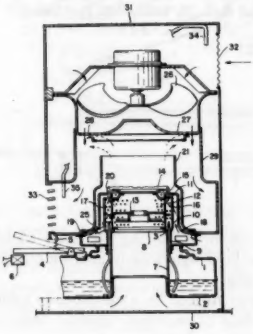
PCT No. PCT/JP82/00102, § 371 Date Nov. 22, 1982, § 102(e) Date Nov. 22, 1982, PCT Pub. No. WO82/03444, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 5, 1982, Ser. No. 451,211

Claims priority, application Japan, Apr. 6, 1981, 56-51462; Apr. 9, 1981, 56-54134

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—76 **4 Claims**



1. A liquid fuel combustion device comprising:

a fuel tank for containing liquid fuel;

a combustion section including a first flame cylinder, a second flame cylinder surrounding said first flame cylinder, and an outer cylinder surrounding said first and second flame cylinders;

a wick having one end in said fuel tank for being immersed in the liquid fuel and the other end disposed between said first and second flame cylinder so as to draw the fuel to said other end;

means for guiding a flow of air to said combustion section to provide oxygen at said other end of said wick to support combustion between said first and second flame cylinders of fuel evaporated from said other end of said wick, such that the heat produced by the combustion serves to evaporate the fuel from said other end of said wick;

means, having an oxygen level indicative output, for detecting the oxygen level in the air guided to said combustion section by said guiding means, said oxygen level detecting means including:

first temperature detecting means for detecting the temperature of combustion exhaust gas resulting from combustion in said combustion section,

second temperature detecting means for detecting the temperature of the air guided to said combustion section by said guiding means, and

means for producing a temperature difference signal indicative of the difference between the respective temperatures detected by said first and second temperature detecting means;

means, adjacent said wick, for electrically heating the liquid fuel; and

means, responsive to said oxygen level indicative output, for energizing said electrically heating means so as to assist

evaporation of liquid fuel from said wick, when the oxygen level in the air guided to said combustion section is below a first level, and for stopping combustion of fuel in said combustion section when the oxygen level is below a second level below said first level;

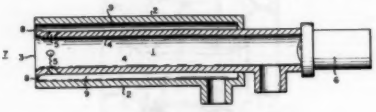
said energizing and stopping means including means, responsive to said temperature difference signal, for energizing said electrically heating means when the temperature difference is below a first temperature value, and for stopping combustion of fuel in said combustion section when the temperature difference is below a second temperature value below said first temperature value.

4,525,138

FLAME SIGNAL ENHANCER FOR POST-MIXED BURNER

William J. Snyder, White Plains; Raymond H. Miller, Hopewell Junction, and Hisashi Kobayashi, Putnam Valley, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 28, 1983, Ser. No. 546,479
Int. Cl.³ F23C *7/00*
U.S. Cl. 431—187 **9 Claims**



1. An apparatus for enhancing the flame signal of a post-mixed burner without significantly altering the flame characteristics comprising:

(a) a passageway formed by a substantially cylindrical tube wall comprised of oxidation resistant material, said passageway having a discharge end;

(b) a tube circumferentially around and axially along the substantially cylindrical tube wall defining an annular flow area between the tube and substantially cylindrical tube wall;

(c) a flame detector which sights down through the passageway;

(d) at least one connecting channel through the substantially cylindrical tube wall proximate the discharge end, communicating between the annular flow area and the passageway; and

(e) a restriction in said annular flow area between the connecting channel and the discharge end such that the pressure of fluid in the annular flow area exceeds the pressure of fluid in the passageway.

4,525,139

BURNER IN A DRUM

Karl R. Bleimann, Matthews; Michael J. Fookes, Salisbury; Richard W. McVicker; John W. Munn, both of Charlotte, and Eugene R. Nelson, Spencer, all of N.C., assignors to Fuchs Systems, Inc., Salisbury, N.C.

Filed Dec. 19, 1983, Ser. No. 562,641
Int. Cl.³ F23C *5/06*
U.S. Cl. 431—189 **16 Claims**

1. A burner assembly comprising:

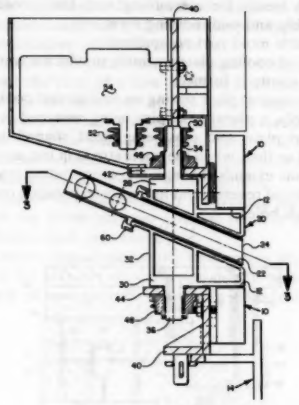
a gland having an opening therethrough;

a mounting frame;

a drum having a curved face, said drum being adapted to fit in to the opening in said gland;

a pivot pin extending from each end of said drum, engageable in said mounting frame and adapted to be journaled for rotation therein;

said drum being provided with a tubular sleeve extending from the curved face through the opposite wall of said drum; and



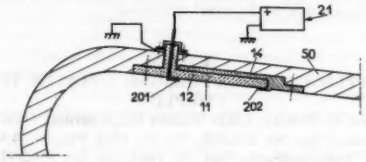
reversible drive means engageable with one of said pivot pins for rotating said pivot pin and said drum through an arc.

4,525,140

IGNITION METHOD AND IGNITER DEVICE FOR IGNITING CARBURATED GASEOUS MIXTURES

Serge Larigaldie, Chatenay-Malabry, and Gérard Labaune, Palaiseau, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales dit O.N.E.R.A., Chatillon, France

Filed Dec. 22, 1981, Ser. No. 333,272
Claims priority, application France, Dec. 29, 1980, 80 27717
Int. Cl.³ H01T *300*; F23Q *3/00*
U.S. Cl. 431—258 **4 Claims**



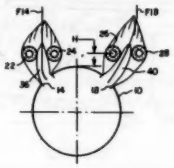
1. A spark discharge device having a controlled discharge path between first and second spaced points comprising first and second electrodes spaced from each other by a solid dielectric having first and second opposed surfaces and an edge between said surfaces, the second surface being positioned to be exposed to carburated gases to be ignited along the discharge path, the first surface being positioned so it is not exposed to the carburated gases, the first and second electrodes being respectively fixedly positioned on the first and second surfaces, the first electrode including a portion astride said edge at the second point and including a portion folded on and in contact with the second surface at the second point, the first electrode further having an elongated path portion disposed on said first surface extending to said first point and defining the discharge path between the first and second points, the second electrode having a small discharge area into the dielectric relative to the area of the elongated path portion along the dielectric, the small area being positioned so it is aligned with the first point, and means for applying a pulsed discharge voltage between the electrodes so that a discharge is estab-

lished on the second surface between the first and second points along a path corresponding with the path of the first electrode elongated path portion.

4,525,141
REGULATION OF BLUE FLAME COMBUSTION EMISSIONS

Douglas W. DeWerth, Cleveland, and Roger D. Sheridan, Brunswick, both of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Jul. 11, 1983, Ser. No. 512,328
Int. Cl.³ F23D *13/12*
U.S. Cl. 431—347 **33 Claims**



8. An atmospheric burner assembly including an array of ports adapted to have a corresponding array of blue flames extending therefrom during combustion of a fuel gas and a flame insert member for reducing the NO_x emission of the burner assembly, said array of flames tending to assume a normal combustion position during combustion under the influence of the natural buoyancy of the flames during combustion, said flame insert member being rigidly mounted to said burner assembly and providing an assembly of elongated insert elements which are spaced from each other and from the burner, pairs of said insert elements extending along said array of ports and including exterior surface portions providing spaced insert surfaces for contacting said array of flames and reducing the peak flame temperature by radiating heat energy away from the flames, said flames having inner cones, said insert surfaces inducing said inner cones of said flames to extend between and engage said insert surfaces during combustion.

4,525,142
PROCESS FOR TREATING FLUE GAS WITH ALKALI INJECTION AND ELECTRON BEAM

Robert J. Gleason, and Paul L. Feldman, both of Somerville, N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Filed Jun. 11, 1984, Ser. No. 619,371
Int. Cl.³ C01B *21/00, 17/00*; B01J *8/00, 1/10*
U.S. Cl. 423—235 **12 Claims**

1. A process for removing pollutants comprising either sulfur oxides or nitrogen oxides or both from effluent gas, the steps comprising:

(a) injecting alkali reagent into the combustion zone of a combustion boiler fired by fuel selected from the group of pulverized coal, liquid hydrocarbon, or mixture thereof, some of said alkali reagent reacting with sulfur oxides in the effluent gas to form a reaction product;

(b) passing said effluent gases and said unreacted alkali out of said combustion boiler and into a cooling stage and cooling said effluent gases and unreacted alkali reagent to below 200° F. such that an additional amount of said alkali reagent react with sulfur oxides in the effluent gas to form a reaction product;

(c) passing the cooled effluent gas and remaining unreacted alkali reagent into an irradiation chamber;

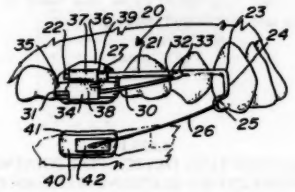
(d) irradiating the effluent gas and unreacted alkali reagent with ionizing radiation in the irradiation chamber causing said unreacted alkali reagent to convert gaseous either sulfur oxides or nitrogen oxides or both either into mist or solid particles or both; and

(e) subjecting the irradiated effluent gas to particulate collection in a particulate collection device.

4,525,143
ORTHODONTIC DEVICE TO SERVE AS REMOVABLE ANCHORAGE FOR ELASTIC TRACTION BETWEEN UPPER AND LOWER MOLARS

Richard M. Adams, 31 McAllister Ave., Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 564,231, Dec. 21, 1983, abandoned. This application Mar. 22, 1984, Ser. No. 592,407
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—5 **22 Claims**



1. An orthodontic installation providing a removable anchorage for elastic traction between upper and lower molars, comprising:

a first metal band for attachment around an upper molar, said band having at least one buccal tube,

an assembly comprising a smaller-diameter wire having a posterior end engaging said band, a larger-diameter wire having a posterior end entering said buccal tube from the anterior side of said first band, connecting means connecting said wires together anteriorly of their posterior end, stop means on said assembly to engage a said tube, to limit the length of entry into said tube, and a short hook extending down from the anterior end of said larger-diameter wire,

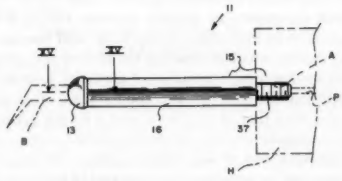
a second metal band encircling a lower molar corresponding to said upper molar, and having anchor means on its buccal side, and

an elastic band joining said lower molar anchor means to said upper hook.

4,525,144
DENTAL ATTACHMENT

Bobby D. Fritz, 801-D Osler Dr., Jonesboro, Ariz. 72401

Filed Aug. 11, 1983, Ser. No. 522,462
Int. Cl.³ A61C *1/07*
U.S. Cl. 433—118 **1 Claim**



1. A dental surgical tool comprising:

(a) an air delivery-type vibratory instrument including a hand-held handle having a fluid passageway therethrough, said handle having a threaded aperture therein;

(b) a cutting blade having a substantially flat shank portion; and

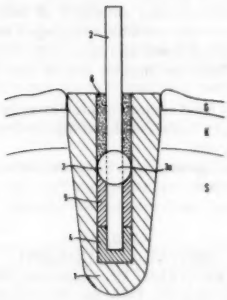
(c) attachment means for attaching said blade to said handle of said vibratory instrument, said attachment means including a collet member having a first end and a second end, said second end of said collet member having a slot receiving said shank portion of said blade, at least a portion of the outer surface of said second end of said collet member flaring outwardly away from said first end, at least a portion of the outer surface of said first end of said collet member being threaded, said attachment means including a sleeve member having a first end and a second end, at least a portion of said first end of said sleeve member being threaded and being received in said threaded aperture of said handle of said vibrating instrument, said second end of said sleeve member having a threaded cavity receiving the threaded portion of said first end of said collet member to cause said blade to be wedged within said slot in said collet member.

4,525,145

CONNECTING DEVICE FOR JOINING A SUPERSTRUCTURE ELEMENT WITH AN IMPLANT MEMBER

Hans Scheicher, Rondell Neuwittelsbach 4, 8000 Munich 19; Dieter Siegele, Freiburg, and Uwe Soltesz, Merzhausen, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angwandten Forschung e.V., Freiburg and Hans Scheicher, Munich, both of, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,630
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—173 **15 Claims**



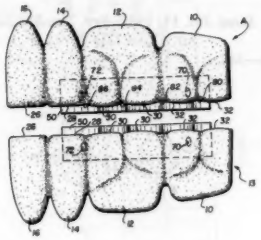
1. An endo-osseous implant adapted to connect a superstructure to the bone and to minimize stress peaks along the length of said implant thereby minimizing bone reduction or degradation, which comprises: an implant member having a bottom part adapted to be embedded in the bone, and having a bore extending therein which is closed at the bottom and open at the top, a rod having a high modulus of elasticity inserted in the bore of said implant member, said rod having a cross-sectional area smaller than that of said bore, and a length greater than that of said implant member, whereby one end thereof extends beyond the open end of said bore; means at the base of said implant member for securing the other end of said rod; projection means essentially surrounding said rod having a cross-sectional area essentially the same as the bore of said implant member, said projection means being located in said bore at a point ranging from about 0–40% of the distance from the middle of the bone embedded part of the implant member measured toward the open end of said bore; and means provided on said one end of said rod for securing a superstructure.

4,525,146

NATURAL APPEARING POSTERIOR TEETH FOR DENTURE PLATES AND THE LIKE

Arnold Lewis, R.D. 4, Cadiz, Ohio 43907, and Norman R. Hagen, 1463 Shirley Ave., Tacoma, Wash. 98406

Filed Dec. 19, 1983, Ser. No. 562,478
Int. Cl.³ A61C *13/08*
U.S. Cl. 433—198 **12 Claims**



1. Natural appearing posterior teeth for denture plates and the like comprising:

(a) a plurality of generally longitudinally aligned interconnected synthetic teeth, including at least a first and a second molar and a bicuspid;

(b) each of said teeth including a crown;

(c) cutting bar means having substantial height secured in said at least a first and second molar and a bicuspid and including a portion extending a relatively short distance above the crown of each of said at least a first and second molar and a bicuspid for providing a masticating surface;

(d) said cutting bar means being continuous and of a generally sinusoidal configuration and including a plurality of crests;

(e) a first crest disposed in said first molar and standing generally longitudinally and laterally a substantial distance along said first molar crown;

(f) a plurality of crests disposed in said second molar, each of said plurality of crests extending generally longitudinally and laterally along said second molar crown a distance less than said first distance;

(g) a last crest disposed in said bicuspid and extending generally longitudinally and laterally a substantial distance along said bicuspid crown and wherein said plurality of crests include at least two crests extending in the same direction and having a trough to peak spacing less than the trough to peak spacing of said first and last crests.

4,525,147

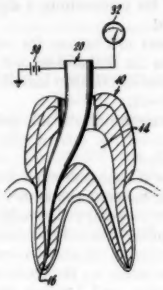
ROOT CANAL IMPLANT, PROXIMITY INDICATIVE, AND METHOD OF IMPLANTATION

Richard J. Pitz, 2 E. 65th St., New York, N.Y. 10021, and Ezekiel J. Jacob, 25 Monroe Pl., Brooklyn, N.Y. 11201

Filed May 31, 1983, Ser. No. 499,392
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—224 **5 Claims**

1. A dental root canal implant comprising a unitary structure

of thermoplastic resin and electrically conductive carbon fibers, whereby said implant is capable of conducting electricity



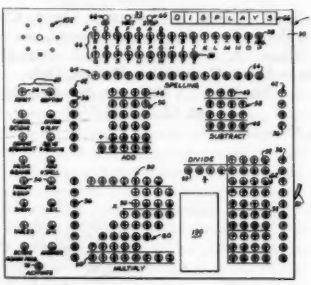
for measuring the proximity of the implant to the apex of a root canal and for heating the thermoplastic resin.

4,525,148

MULTI-MODAL EDUCATIONAL AND ENTERTAINMENT SYSTEM

Sarukkai R. Narayanan, 2120 NW. 113th St., Oklahoma City, Okla. 73120

Filed Mar. 31, 1983, Ser. No. 462,675
Int. Cl.³ G09B 7/00
U.S. Cl. 434—340 **31 Claims**



1. An improved multi-modal automated educational and entertainment device comprising:

a housing;

logic means for processing and comparing preprogrammed data with input and control data;

memory means for storing programs and input data, the memory means being operably connected to the logic means;

a plurality of first input means for providing control signals and predefined data signals to the logic means, the first input means forming a plurality of non-relational sections within predefined portions of the housing;

a plurality of second input means for providing location indication signals representing the location of variable data, the second input means forming at least one relational section within a predefined portion of the housing; and

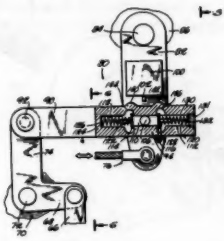
stylus means for selectively activating the first and second input means, said stylus means including marking means for marking said second input means, said relational section arranged to require relational positioning of input data by the stylus means that corresponds to required manual activities utilized in solving mathematical problems and the like.

4,525,149

MARINE PROPULSION DEVICE INCLUDING IGNITION INTERRUPTION MEANS TO ASSIST TRANSMISSION SHIFTING

George L. Broughton; Jeffrey P. Higby, both of Waukegan, Ill., and Robert F. Young, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 16, 1982, Ser. No. 369,072
Int. Cl.³ B63H 5/06
U.S. Cl. 440—1 **7 Claims**



1. A marine propulsion device including an internal combustion engine, a propulsion unit, a propeller shaft rotatably mounted in said propulsion unit and carrying a propeller, a drive shaft rotatably mounted in said propulsion unit and driven by said internal combustion engine, a transmission drivingly connecting said drive shaft with said propeller shaft and shiftable between a drive position and a neutral position, a movable first member operably connected to said transmission for shifting thereof between a drive position and a neutral position in response to movement of said first member, a second member movable in response to shifting actuation by an operator, a third member connected to said first member, a fourth member connected to said second member for pivotal movement therebetween and connected to said third member for translatory movement therebetween from a reference position whereby to obtain translatory movement of said third member relative to said second member, means releasably holding said fourth member against movement relative to said third member and from the reference position in the absence of shift resistance greater than a predetermined value, and means for selectively interrupting engine ignition only in response to relative movement of said third and fourth members.

4,525,150

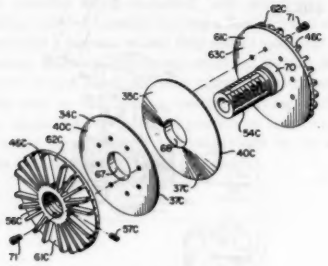
BELT PULLEY AND METHOD OF MAKING THE SAME

Terrence R. Quick; Paul M. Standley; Mark P. Foley, all of Springfield; Anderson W. Howerton, Christian County; Joseph P. Miranti, Jr., Porter Township, Christian County; Larry R. Oliver; Gerald C. Holloway, Jr., both of Springfield, and Kenneth D. Richmond, Garden Grove Township, Christian County, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Aug. 30, 1982, Ser. No. 413,031
Int. Cl.³ F16H 57/04
U.S. Cl. 474—93 **10 Claims**

1. In a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about a longitudinal axis of said hub, said pulley having a pair of opposed facing sides defining at least part of said groove therebetween and having a pair of oppositely facing outboard sides, said sides each having an inner peripheral portion and an outer peripheral portion, said pulley having a plurality of circumferentially spaced apart and radially disposed substantially straight vanes extending outwardly from said outboard sides thereof, each said vane having an inner peripheral end and an outer peripheral end respectively disposed adjacent said inner peripheral portion and said outer

peripheral portion of its respective outboard side and having an outer edge that is disposed substantially transverse to said longitudinal axis of said hub from substantially said inner peripheral end thereof to said outer peripheral end thereof and is spaced outwardly from said respective outboard side from substantially said inner peripheral end thereof to said outer peripheral end thereof whereby said vanes are adapted to act



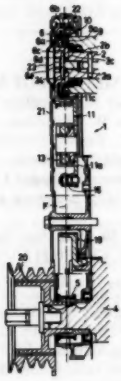
on fluid adjacent said pulley to tend to cool said pulley with said fluid, the improvement comprising a pair of plate means respectively carrying said vanes for said outboard sides of said pulley and being respectively secured to said outboard sides of said pulley to rotate in unison therewith, each said plate means having part of said hub carried thereby and being secured to said part of said hub of the other plate means whereby said parts define said hub of said pulley.

4,525,151

TIMING ADJUSTMENT MECHANISM IN WRAPPING CONNECTOR DRIVING DEVICE

Tsutomu Tomita, Okazaki; Kimihide Horio, and Tadahisa Naganawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1982, Ser. No. 433,280
Claims priority, application Japan, Mar. 8, 1982, 57-36173
Int. Cl.³ F16H *7/08*
U.S. Cl. 474—101 **11 Claims**



1. A multi-shaft endless connector driving device having a timing adjustment mechanism, the device comprising:

first and second rotatable shafts;

a first drive pulley fixedly mounted on the first rotatable shaft;

a second drive pulley fixedly mounted on the second rotatable shaft, said second pulley fitting tightly on the shaft and being seated on an end surface of said shaft;

an endless non-slip connector trained around said first and second pulleys for transmitting a driving force between said pulleys; and

a timing adjustment mechanism for adjusting the angular relation between the first and second rotatable shafts, the timing adjustment mechanism including:

an idle pulley lever;

bearing means supporting the idle pulley lever for pivoting motion about the axis of rotation of said second rotatable shaft;

a first idle pulley rotatably secured to the idle pulley lever and contacting the endless connector on one side of, and adjacent to, the second drive pulley;

a second idle pulley rotatably secured to the idle pulley lever and contacting the endless connector on the other side of, and adjacent to, the second drive pulley; and

means for pivoting and holding the idle pulley lever within a predetermined angular range for adjusting the angular relation between the first and second rotatable shafts, wherein

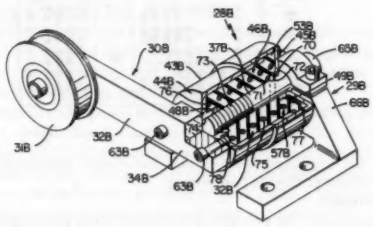
said bearing means supporting the idle pulley lever for pivoting motion about the axis of rotation of the second shaft is coplanar with the second drive pulley and the first and second idle pulleys, whereby the resultant of tension forces in the endless connector acting on the first and second idle pulleys exerts no bending moment on said bearing means.

4,525,152

BELT TENSIONER AND METHOD OF MAKING THE SAME

Billy L. Speer, Wilson "B" Township, Greene County; Lee R. Burris, Porter Township, Greene County, and Jerry W. Rogers, Wilson "A" Township, Greene County, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jul. 27, 1982, Ser. No. 402,404
Int. Cl.³ F16H *7/12*
U.S. Cl. 474—133 **10 Claims**



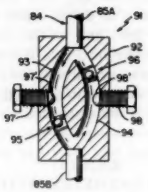
1. In a tensioner for a power transmission belt or the like that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, polymeric spring means being operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and coiled mechanical spring means also being operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt whereby said polymeric spring means and said mechanical spring means combine to define the tensioning force for said belt while said polymeric spring means additionally tends to dampen the movement of said belt engaging means relative to said support means, the improvement wherein said mechanical spring means is substantially completely embedded in said

polymeric spring means so that said mechanical spring means is substantially completely engaged and surrounded by said polymeric spring means, said mechanical spring means comprising a compression spring.

4,525,153
BELT TENSIONER AND METHOD OF MAKING THE SAME

Leslie B. Wilson, Reeds Spring, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 296,695, Aug. 27, 1981, Pat. No. 4,411,638. This application Jul. 21, 1983, Ser. No. 516,009
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.³ F16H *7/12*; F16F *9/48*
U.S. Cl. 474—138 **16 Claims**



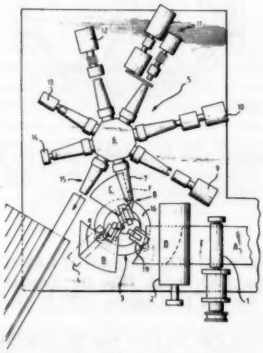
1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and dampening means to dampen the movement of said belt engaging means relative to said support means with a restricting force of said dampening means, said dampening means comprising fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, the improvement wherein said dampening means comprises a closed fluid loop arrangement that has means that dampens the movement of said belt engaging means with a greater said restricting force when said belt engaging means is being moved in one direction relative to said support means than said restricting force of said dampening means when said belt engaging means is being moved in the opposite direction relative to said support means.

4,525,154
FOIL TRANSFER DEVICE FOR AN INSTALLATION FOR MANUFACTURING HOLLOW TRUNCATED CONE SHAPED ARTICLES AND IN PARTICULAR WINE BOTTLE CAPS

Bernard Sauget, Plaisir, France, assignor to Construction-Gerance-Exploitation "CONGEX" , Les Clayes Sous Bois, France

Filed Nov. 4, 1983, Ser. No. 548,835
Claims priority, application France, Nov. 10, 1982, 82 18932
Int. Cl.³ B31B *49/02*
U.S. Cl. 493—154 **9 Claims**

1. An installation for manufacturing, from flexible foils, hollow truncated cone shaped articles and in particular caps for wine bottles with a widened neck, this installation comprising a pre-cutting out post (2) where foil blanks (B) are cut out in succession from a continuous strip (A), a finishing cutting out post (4) where foils (C) having the final required dimensions are produced from these blanks, a rolling up post (8) where each of these foils is rolled on a respective truncazted cone shaped sleeve (7) of a device (5) for shaping hollow articles, adapted to be driven with a stepped rotational movement, and a transfer device (3) which moves the foil blanks one by one between the pre-cutting out post (2) and the finishing cutting out post (4), then brings the foils from this latter to the rolling up post (8), this installation being characterized in that the transfer device comprises at least one gripping member (19) mounted for pivoting about a first axis (19*a*) on a support (16) which is itself adapted to be moved in synchronism with the stepped rotation of the shaping device (5), by three successive angular steps per revolution about a second axis (16*a*) with respect to which the precutting out (2), finishing cutting out (4) and rolling up (8) posts of the installation are centered, so that between the three angular rotations of its support, the gripping



member (19) is immobilized successively in a first position (P1) in which it grasps a foil blank opposite the pre-cutting out post (2), a second position (P2) in which it presents this blank under the finishing cutting out post (4) and a third position (P3) in which it releases the cut out foil opposite the rolling up post (8), the transfer device (3) further comprising a mechanism (24) for orientating the gripping member (19) for causing it to pivot through a preset angle about the said first axis (19*a*), between its first and its second positions (P1, P2), then holding it as far as its third position (P3) in the orientation which it has in its second position (P2) and placing it again in its first position (P1) in its starting orientation and means for adjusting the starting orientation of the gripping member (19) depending on the conicity to be given to the finished hollow articles.

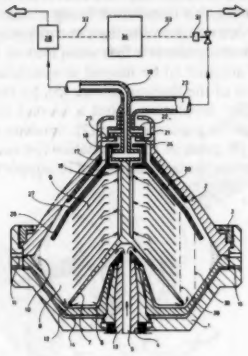
4,525,155
CENTRIFUGAL SEPARATOR AND METHOD OF OPERATING THE SAME

Vilgot Nilsson, deceased, late of Hägersten, Sweden (by Mary Nilsson and Goran Nilsson, legal representatives), assignor to Alfa-Laval Marine and Powering Engineering AB, Tumba, Sweden

Filed Apr. 11, 1984, Ser. No. 599,063
Claims priority, application Sweden, Apr. 20, 1983, 8302215
Int. Cl.³ B04B *11/00*
U.S. Cl. 494—3 **15 Claims**

1. A centrifugal separator comprising a rotor having a separating chamber and an inlet for supplying said chamber with a mixture of light and heavy liquids, the rotor being operable to form in said chamber an interface layer between separated light and heavy liquids of said mixture, first and second outlet means for discharge of separated light and heavy liquids, respectively, from said separating chamber, said second outlet means including a channel extending radially inward from an inlet opening of the channel located in the radially outer part of the separating chamber, control means for initiating discharge through said second outlet means in response to movement of said interface layer radially inward to an inner level in the

separating chamber, said layer moving radially outward when heavy liquid is discharged through said second outlet means, and a control unit responsive to operation of said control



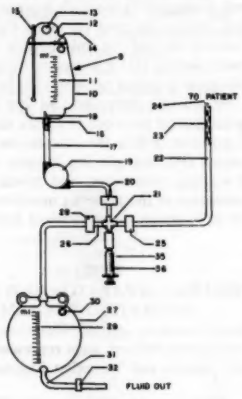
means for stopping said discharge through the second outlet means when a desired amount of heavy liquid has left said chamber through said second outlet means.

4,525,156

METHOD FOR STOMACH LAVAGE

John E. Benusa, 1383 Temple Hills Dr., Laguna Beach, Calif. 92651, and Richard L. Kingston, 1577 E. 6th St., St. Paul, Minn. 55106

Filed Feb. 16, 1983, Ser. No. 439,751
Int. Cl.[3] A61M *1/00*
U.S. Cl. 604—28 **10 Claims**



1. A method for providing a closed stomach lavage, comprising the steps of:

(a) supplying liquid by gravity feed from a flexible reservoir bag having graduations thereon, to an attached feed line having a bore size of about 8–10 mm and a length of about 3–10 feet, the feed line having manual closure means, and being connected to a connection-T;

(b) feeding the liquid from the feed line to a connection-T and to a manually closable, multi-perforated stomach lavage tube attached to the connection-T;

(c) supplying liquid through the lavage tube to the stomach of a patient, and manipulating the lavage tube to remove, by siphoning, foreign matter from the stomach, without the formation of red suction bruises;

(d) siphoning the foreign matter from the stomach lavage tube to a manually closable discharge line connected to the connection-T and then to a discharge bag having an effluent line;

the reservoir bag, feed line, lavage tube, discharge line and discharge bag being disconnectably mounted from each other and the connection-T to form a closed system;

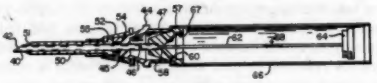
whereby: i. the feed line is sized to admit by hand metering, about 7–8 liters of liquid from the reservoir bag in about 10–30 minutes for multiple washings of about 300–500 ml each during a period of about 8–25 seconds; ii. by gravity feed through the lavage tube to a patient; iii. the volume of liquid admitted from the reservoir bag to the patient being correlated with the graduated scale; v. material from the stomach of the patient being siphoned through the discharge line and into the discharge bag; vi. during use, the connection-T can be disconnected to enable removal of material clogging the connection-T; vii. the closure means on the feed line and lavage tube are open and the discharge line is closed to admit liquid from the reservoir through the feed line, and to the lavage tube, and the closure means on the feed line is closed when the discharge line is open to admit material from the stomach to the discharge line and discharge bag; and, viii. following use, the lavage parts are discarded.

4,525,157

CLOSED SYSTEM CATHETER WITH GUIDE WIRE

Vincent L. Vaillancourt, Livingston, N.J., assignor to Manresa, Inc., Hillsdale, N.J.

Filed Jul. 28, 1983, Ser. No. 518,122
Int. Cl.[3] A61M *5/00, 25/00*
U.S. Cl. 604—52 **23 Claims**



1. A catheter system for the introduction and placement of a flexible catheter in and into the lumen of a blood vessel such as an artery or vein by a practitioner and using an advancement of a guide wire into said lumen to guide the catheter as it is positioned in said lumen, said catheter system including:

(a) a hollow cannula of a determined length and having a sharpened entering end and an exit end;

(d) a needle hub axially secured and mounted to said cannula and in an assembled condition providing a manipulable needle, said hub positioned at a selected distance from the sharpened end of the cannula, this hub having a skirt portion providing an interior cavity and open to the rear thereof, this hub having a contoured forward end;

(c) a flashback indicating means disposed at or near the exit end of said cannula, this flashback indicating means in flow communication with said cannula to indicate an initial penetration of said wall of the vessel by a flow of blood through this cannula;

(d) a flexible catheter that is formed with a through bore that is sized so as to be slideable on and along the outer diameter of the cannula, said catheter having an entering end tapered so as to be easily insertable with the introduction of the cannula into the lumen and with a rear end of said catheter attached to a hub, the catheter of a length so that in mounted condition on the cannula and with the hub of the catheter slideably and removably mounted on the contoured forward end of the cannula whereat the sharpened end of the cannula extends beyond the tapered entering end of the catheter, the hub of the needle being manipulated and advanced by a practitioner so that penetration of a wall of a vessel is achieved by the sharpened end of the cannula;

(e) a centering plug within the needle hub and means for

retaining said centering plug within said cavity, this plug having a small through guideway axially positioned and terminating so as to be substantially contiguous with the exit end of the cannula and in alignment with the bore of the hollow cannula;

(f) a guide wire positioned and sized so as to be a slide fit in the guideway in the centering plug and in the bore of the cannula and disposed to be advanced by manipulation to and through said guideway and bore of the cannula and as said guide wire exits from the entering end of the cannula the advancing guide wire is bent as it enters and follows the lumen of the vessel;

(g) inhibiting means cooperatively positioned in and with the guideway and guide wire so as to prevent accidental and unwanted advancement of the guide wire into the guideway and bore of the cannula, and

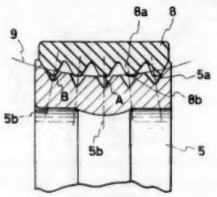
(h) a tubular enclosure of a very thin wall and flexible and secured at one end to the needle hub and providing within said enclosure a sterile environment as and while attached to the needle hub and said guide wire is advanced, whereas and after the guide wire and catheter are advanced to the desired placement in the lumen of the vessel said needle hub and attached cannula, guide wire and tubular enclosure are separated as an array from the catheter and its hub and with said separated array now discarded.

4,525,158

BELT-PULLEY DRIVE MECHANISM

Hideki Tanaka; Masanori Kamimura; Koji Horikawa, and Katsuyuki Kawasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 20, 1983, Ser. No. 563,611
Claims priority, application Japan, Dec. 21, 1982, 57-225562
Int. Cl.³ F16H 7/02
U.S. Cl. 474—167 **9 Claims**



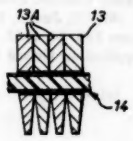
1. A belt-pulley drive mechanism comprising a pulley having a plurality of circumferentially extending grooves of V-shaped cross-sectional configuration, a belt adapted to be passed around the pulley and stretched under tension so that the belt is engaged with the pulley in torque transmitting relationship, said belt being formed with a plurality of longitudinally extending ridges of V-shaped cross-sectional configuration which are adapted to be engaged with said grooves in said pulley when the tension is applied to the belt, at least one of said grooves and said ridges being formed in a cross-section along a concave line so that a clearance is formed between the pulley and the belt when the tension is removed from the belt, said clearance being larger at a transversely central portion than at side edge portions.

4,525,159

BELT AND PULLEY TRANSMISSION

René Filderman, Neuilly sur Seine, and Michel Pilache, Maisons Lafitte, both of France, assignors to Valeo, Paris, France

Continuation of Ser. No. 320,940, Nov. 13, 1981,. This application Oct. 19, 1984, Ser. No. 662,793
Int. Cl.³ F16G 1/00, 5/00, 1/21, 1/22
U.S. Cl. 474—201 **7 Claims**



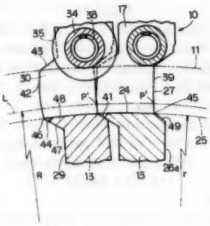
1. A belt drive transmission comprising a nonlubricated push block belt passing over pulleys, said push block belt comprising a stack of blocks carried by at least one support band, said blocks being made of sintered metal, at least one of said blocks having a coefficient of friction with said pulleys which is substantially lower than that of the rest of said blocks, said blocks of sintered metal and the said at least one block all haing sufficient lateral extend to engage the pulleys when passing about the pulleys.

4,525,160

ENDLESS BELT MEMBER FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Susumu Okawa, Numazu; Hideaki Matsui, Gotenba; Yasunobu Jufuku, and Toshimi Kato, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 14, 1984, Ser. No. 579,968
Claims priority, application Japan, Apr. 14, 1983, 58-66505
Int. Cl.³ F16G 5/18
U.S. Cl. 474—242 **7 Claims**



1. A continuously variable transmission means for transmitting torque between a V-shaped driving pulley and a V-shaped driven pulley, comprising:

an endless carrier consisting of a plurality of metallic hoops extending between and contacted around peripheral portions of said driving and driven pulleys, the endless carrier assuming a radius when contacted around said peripheral portions; and

a plurality of V-shaped block members being longitudinally shiftable along the metallic hoops, the block members being linked together and extending around the total circumference of the metallic hoops, each block member having at least one longitudinal projection on a first surface, and at least one longitudinal recess complementary to the projection on a second surface, the second surface being located longitudinally opposite to the first surface, whereby the longitudinal projection on each V-shaped block member engages with the longitudinal recess of an adjacent block member at a point having a radius which is

substantially similar to the radius of the endless carrier when said endless carrier contacts a peripheral portion of one V-shaped pulley.

4,525,161

METHOD FOR PRODUCING TOBACCO SMOKE FILTERS

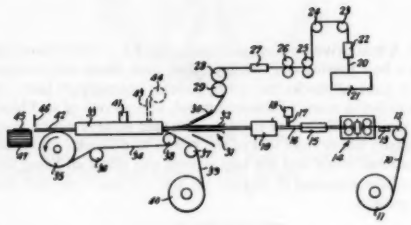
John A. Luke, Hampshire, England, assignor to British-American Tobacco Company Limited, London, England

Division of Ser. No. 269,702, Jun. 3, 1981, Pat. No. 4,388,934. This application Feb. 14, 1983, Ser. No. 466,150

Claims priority, application United Kingdom, Jun. 18, 1980, 8019887

Int. Cl.³ A24C *5/50*

U.S. Cl. 493—42 **10 Claims**



1. A method of producing tobacco smoke filters including the steps of, feeding a continuous tube of smoke filtration material to ensheathing means, feeding fibrous material to said ensheathing means whereby at exit from said ensheathing means said tube is ensheathed in a layer of smoke-pervious layer of said fibrous material, cutting the ensheathed tube into discrete lengths, and in each of said lengths, rendering a cross-section of the ensheathing material impervious to the passage of tobacco smoke, and closing the tube of said length at a location spaced longitudinally from said cross section of said ensheathing material.

4,525,162

PARENTERAL CONTROLLED DELIVERY

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 568,457, Jan. 5, 1984, which is a continuation of Ser. No. 325,206, Nov. 27, 1981, Pat. No. 4,432,756. This application Mar. 9, 1984, Ser. No. 587,781

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ A61M *5/16*

U.S. Cl. 604—56 **33 Claims**

1. A method for administering a drug formulation to a recipient, the method comprising:

(a) admitting intravenously into the recipient a delivery member in communication with an intravenously delivery system, said delivery system comprising:

(1) a primary path in fluid communication with a primary container of a fluid for the flow of the fluid therethrough;

(2) a secondary path in fluid communication with a secondary container of a fluid for the flow of the fluid therethrough;

(3) a formulation chamber in fluid communication with the secondary path, the formulation chamber comprising;

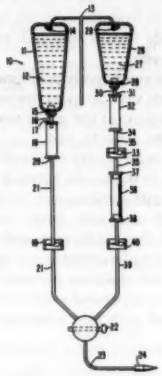
(i) a wall surrounding a lumen;

(ii) inlet means for letting fluid into the chamber;

(iii) outlet means for letting fluid leave the chamber; and,

(iv) a drug in solid form in a means for releasing drug to fluid that enters the chamber and contacts the means to form a fluid drug formulation containing from a trace to a saturated amount of drug, said means maintaining its physical and chemical integrity in the presence of the fluid;

(4) a common path for receiving fluid from the primary path and for receiving fluid from the secondary path, said common path in communication with the delivery member;



(5) means for controlling fluid flow through the primary, secondary and common paths in fluid communication with the intravenous delivery system; and,

(b) administering the drug formulation to the recipient by permitting fluid to flow into the formulation chamber and letting said drug formulation formed in situ flow into the common path.

4,525,163

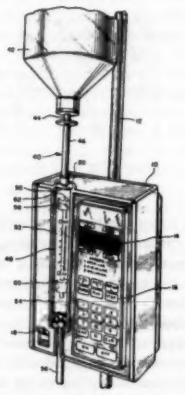
INTRAVENOUS SET FLOW CONTROL DEVICE

William H. Slavik, Palos Hills, and William B. Huber, Oak Park, both of Ill., assignors to Nuvatec, Inc., Downers Grove, Ill.

Filed Aug. 6, 1982, Ser. No. 406,118

Int. Cl.³ A61M *5/16*

U.S. Cl. 604—65 **23 Claims**



1. A flow control device for use with an intravenous set comprising a drip chamber, a volumetric chamber having a predetermined volume connected to the drip chamber, and externally actuated means for selectively interrupting fluid

flow into the volumetric chamber, said flow control device comprising:

means for measuring a drop rate indicative of the rate of drop formation in the drip chamber;

means for designating a selected volumetric flow rate;

means for designating a selected drop rate;

means for storing the selected volumetric flow rate;

means for automatically controlling fluid flow out of the drip chamber to cause the measured drop rate in the drip chamber to approach the selected drop rate;

means for automatically actuating the interrupting means to cause the volumetric chamber to fill and empty repeatedly such that said volumetric chamber repeatedly dispenses said predetermined volume; and

means for automatically and repeatedly measuring the rate at which the volumetric chamber empties to determine a parameter indicative of the volumetric flow rate of fluid out of the volumetric chamber and for automatically modifying the selected drop rate in response to said parameter to cause the volumetric flow rate of fluid out of the drip chamber to approach the selected volumetric flow rate.

4,525,164

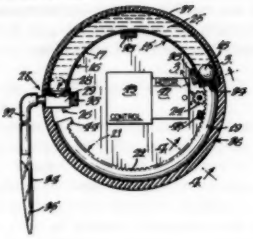
WEARABLE MEDICATION INFUSION SYSTEM WITH ARCUATED RESERVOIR

Marvin P. Loeb, Chicago, and Arne M. Olson, Villa Park, both of Ill., assignors to Biotek, Inc., Santa Ana, Calif.

Filed Apr. 24, 1981, Ser. No. 257,002

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—131 **28 Claims**



1. A wearable medicator suitable for controlled subcutaneous dispensing of liquid medication into a patient which comprises:

(a) a frame adapted for removable attachment to the patient;

(b) an arcuate tubular reservoir for liquid medication removably mounted on the frame, the reservoir having a dispensing nozzle and a closed opposite end having means for mounting on the frame;

(c) a connecting means attached to the dispensing nozzle for introducing the liquid medication into the patient;

(d) a volume reducing means operably associated with the reservoir so as to dispense the liquid medication from the reservoir;

(e) motor means operably associated with the volume reducing means, the motor means being surrounded by the tubular reservoir; and

(f) control means operably associated with the motor means for controlling the action of the volume reducing means.

4,525,165

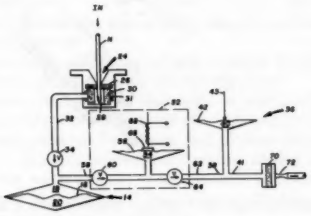
FLUID HANDLING SYSTEM FOR MEDICATION INFUSION SYSTEM

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 34,155, Apr. 27, 1979, Pat. No. 4,373,527. This application Nov. 4, 1982, Ser. No. 439,138

Int. Cl.³ A61M *7/00*

U.S. Cl. 604—131 **30 Claims**



1. An infusion apparatus for providing medication to a living body of a patient comprising:

a medication reservior for storing selected medication;

means for pumping said selected medication responsive to actuating commands for pumping fixed volume pulses at a variable rate, said pump means operating in a pulsatile mode, the input of said pump means being in communication with said reservior;

means for actuating said pump means at a variable rate;

means for accumulating said selected medication, said means for accumulating comprising a variable volume chamber, the input of said accumulator means being in communication with the output of said pump means whereby said accumulator means may be filled at a variable rate governed by said pump means;

means for restricting the flow of said selected medication, the input of said flow restrictor means being in communication with the output of said accumulator means, said flow restricator means in combination with said accumulator means smoothing the pulsatile nature of the flow of said selected medication; and

means for communicating said selected medication from the output of said flow restrictor means to said living body.

4,525,166

ROLLED FLEXIBLE MEDICAL SUCTION DRAINAGE DEVICE

Roland-Yves J. Leclerc, Nogent-le-Rotrou, France, assignor to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Nov. 18, 1982, Ser. No. 442,583

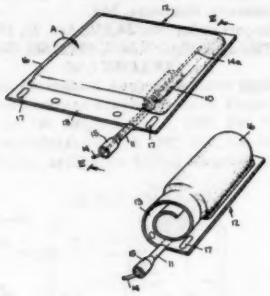
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146266

Int. Cl.³ A61M *37/00*

U.S. Cl. 604—133 **18 Claims**

1. A suction drainage device comprising a receptacle of flexible material capable of being folded, rolled and the like, fluid-sorbing material disposed in the receptacle, fluid passage means coupling the exterior of the receptacle to the interior of the receptacle and adapted to be communicated with a source of fluid located at the exterior of the receptacle, and a flexible check valve disposed in the receptacle at a side of one edge of the same and being operative to seal and open communication between the interior of the receptacle and said passage means

in response to the condition of the receptacle and a thin tube extending through the flexible valve to the exterior of the



receptacle through said passage means which is adapted to be pulled out of the valve and said passage means.

4,525,167

BODY FLUID SUCTION DEVICE

Edward M. Goldberg, 225 Maple Hill Rd., Glencoe, Ill. 60022, and Seymour Bazell, 9235 N. Latrobe, Skokie, Ill. 60077

Division of Ser. No. 184,235, Sep. 5, 1980, Pat. No. 4,404,924. This application Aug. 4, 1983, Ser. No. 520,434

Int. Cl.[3] **A61M** *1/06*

U.S. Cl. 604—135 **10 Claims**

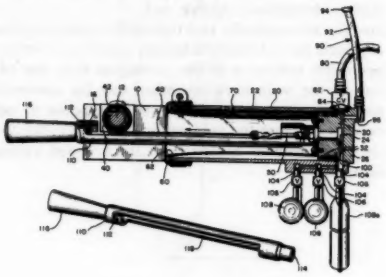
1. A drainage device for receiving body fluids from a patient comprising, in combination:

variable volume container means, provided by an elongated cylindrical chamber with transverse end wall means positioned transversely across and substantially closing one end of the cylindrical chamber;

a movable piston with a side wall, positioned in said cylindrical chamber with peripheral seal means provided on the side wall of the piston and arranged to seal against the inner wall of the elongated cylindrical chamber to provide a seal thereat;

means providing an intake to the interior of the cylindrical chamber adjacent the end thereof closed by said end wall means, whereby to provide, with the container means and the piston therein, a variable volume chamber adapted for receiving into and storing therein body fluids drawn from a patient;

a substantially constant force producing coiled ribbon spring secured to said piston and adapted to bias said piston, in a direction away from the transverse end wall of the container means with a substantially constant force, so that a



substantially constant sub-atmospheric pressure is created inside the container for the range of positions of the movable piston within the cylindrical chamber;

an elongated tool that is selectively connectable to and separable from the variable volume container means, for selectively manually moving the piston toward the transverse end wall means of the cylindrical chamber against the force of the coiled ribbon spring; and

said tool including an elongated rigid bar having an end section constructed and arranged to bear against the side of the piston that is distal from the transverse end wall means of the variable volume container means.

4,525,168

METHOD OF TREATING POLYARAMID FIBER

David R. Kelly, Dalton, Ga., assignor to Professional Chemical & Color, Inc., Dalton, Ga.

Filed Jan. 27, 1984, Ser. No. 574,323
Int. Cl.[3] D06M *3/24*
U.S. Cl. 8—130.1 11 Claims

1. A method of treating polyaramid fiber, comprising the steps of:

swelling the fiber,

introducing into the swollen fiber a substance capable of forming an ionic bond with an anionic dye, and

shrinking the fiber so as to incorporate said substance into the fiber.

4,525,169

ARTIFICIAL GRAIN LEATHER HAVING DIFFERENT COLOR SPOT GROUPS

Akira Higuchi, Otsu, and Miyoshi Okamoto, Takatsuki, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,887
Claims priority, application Japan, Jul. 8, 1982, 57-118969; May 16, 1983, 58-84198
Int. Cl.[3] D06N *3/04, 3/18;* D06P *3/86, 3/87*
U.S. Cl. 8—485 12 Claims

1. An artificial grain leather having fiber bundles and color spot groups differing in hue, lightness value and combinations thereof between adjacent fiber bundles, comprising a fibrous substrate layer and a transparent coating layer on the surface thereof, said transparent coating layer having a grain pattern on the outer surface thereof, said substrate layer comprising ultra fine fibers, bundles of ultra fine fibers and high molecular weight elastomer, and said ultra fine fibers comprising at least two types of ultra fine fiber material having different dyeability which have been dyed with different dyestuffs.

4,525,170

SOLID FORMULATIONS OF METAL COMPLEX DYES

Paolo Balliello, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 19, 1983, Ser. No. 496,036
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3220042
Int. Cl.[3] C09B *67/24;* D06P *3/02*
U.S. Cl. 8—524 9 Claims

1. A non-effervescent solid formulation of a metal complex dye having a cold water solubility or dispersivity of at least 30 grams per liter, which formulation is obtained by spray drying an aqueous solution or dispersion of a metal complex dye, and which solution or dispersion consists essentially of water, the metal complex dye, an anionic dispersant and 1 to 20% by weight, based on the final formulation, of a non-ionic ethylene oxide adduct having a molecular weight of 200 to 5000.

4,525,171

GRADIENT PROCESS OF GROWING CRYSTALS FROM LIQUID MEDIA

Paul O. Knischka, Steyr, Austria, and Hans J. Grenz, Munich, Fed. Rep. of Germany, assignors to Knischka Rubine Gesellschaft m.b.H, Vienna, Austria

PCT No. PCT/AT83/00008, § 371 Date Nov. 8, 1983, § 102(e) Date Nov. 8, 1983, PCT Pub. No. WO83/03431, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 30, 1983, Ser. No. 555,874
Claims priority, application Austria, Mar. 30, 1982, 1226/82
Int. Cl.[3] B01D *9/02*
U.S. Cl. 23—300 2 Claims

1. A gradient process of growing crystals from liquid media, comprising growing the crystals in a solvent which at the instantaneous temperature and under the instantaneous pressure employed in the growing process has a density which is equal or approximately equal to the density of the crystals which are being grown.

4,525,172

METHOD OF DEWATERING A CAKE OF BIOMASS

Sture Eriksson, Karlstad, Sweden, assignor to Armerad Betong Vägförbättringar Aktiebolag, Stockholm, Sweden

Filed Feb. 6, 1984, Ser. No. 577,006
Claims priority, application Sweden, Feb. 14, 1983, 8300753
Int. Cl.[3] C10F *7/06, 5/00, 7/00*
U.S. Cl. 44—32 19 Claims

1. Method of dewatering peat or other biomass, said method comprising the steps of:

preparing a water suspension of said biomass; forwarding said biomass suspension to a dewatering plant;

pre-dewatering said biomass suspension in said dewatering plant to produce pre-dewatered biomass, said pre-dewatering being effected by passing said biomass suspension through a series of pre-watering devices so that at least 50% of the water content in said biomass suspension has been removed when said biomass leaves the last of said pre-watering devices i ı said series;

transferring said pre-dewatered biomass in the form of a cake to at least one closed wash press;

wash press dewatering said pre-dewatered biomass in said at least one closed wash press by subjecting said cake to further dewatering, washing, or displacement of water therein by water which is warmer than said cake, and subsequently subjecting said cake to warming and roller pressure under gradually increased pressure at a temperature which is above 90° C. in the region of highest pressure of said roller pressing;

returning hot return water from said roller pressing to at least the last of said pre-dewatering devices so as to raise the temperature of the biomass in the last pre-dewatering device to thereby reduce viscosity of the biomass and increase drainage rate;

drying said mass in a succeeding dryer subsequent to said wash press dewatering.

3. Method according to claim 1, wherein the displacement of the water in said cake is done by steam without vaporization of the water in said cake.

11. Method according to claim 1, wherein the biomass is subjected to a combination of chemical, thermal, and mechanical treatments in order to improve the drainage ability of the biomass in said pre-dewatering devices by breaking some of the colloidal systems in the biomass, said chemical treatment including adding peat ash to the biomass, and said thermal and mechanical treatments comprising homogenizing the pre-dewatered biomass from each of said pre-dewatering devices and warmer return water from a succeeding pre-dewatering device.

4,525,173

MINERAL SLURRIES

Peter J. Baker, Daventry; David A. Brookes, Orpington, and Martin Johnson, Oakley, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed May 17, 1983, Ser. No. 495,420
Claims priority, application United Kingdom, May 19, 1982, 8214648
Int. Cl.[3] C10L *1/32*
U.S. Cl. 44—51 8 Claims

1. A pumpable slurry of coal particles in water consisting essentially of coarse coal particles having a particle size in the range 5 to 50 mm and fine coal particles having a particle size less than 200 micron wherein the slurry contains 50 to 85% by weight of coal particles based on the combined weight of coal particles and water, at least 30% by weight of the coal particles being in the form of coarse particles, 10% to 40% by weight being in the form of fine particles and the balance to 100% by weight being intermediate sized particles.

4,525,174

METHOD AND FUEL COMPOSITION FOR CONTROL OF OCTANE REQUIREMENT INCREASE

Michael C. Croudace, Huntington Beach, Calif., assignor to Union Oil Company Of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 451,279, Dec. 20, 1982, Pat. No. 4,444,565. This application Dec. 27, 1983, Ser. No. 565,986
Int. Cl.[3] C10L *1/18*
U.S. Cl. 44—68 60 Claims

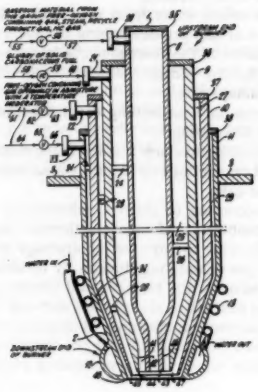
1. A method for operating a spark ignition internal combustion engine which comprises continuously or intermittently introducing, with the combustion intake charge to said engine, a fuel composition containing an octane requirement increase-inhibiting amount of (a) an oil-soluble iron compound, (b) a volatile mono carboxylic acid or ester, and (c) a non-volatile polar compound capable of solubilizing carbonaceous engine deposits, wherein said non-volatile polar compound is introduced either simultaneously with said oil-soluble iron compound and said volatile carboxylic acid or during the intermission.

4,525,175

HIGH TURN DOWN BURNER FOR PARTIAL OXIDATION OF SLURRIES OF SOLID FUEL

Robert J. Stellaccio, Spring, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 499,620, May 31, 1983, Pat. No. 4,443,230. This application Dec. 16, 1983, Ser. No. 562,335
Int. Cl.[3] C10J *3/48*
U.S. Cl. 48—86 R 6 Claims



1. A high turn-down burner for simultaneously introducing a plurality of streams of free-oxygen containing gas in admixture with a pumpable slurry of solid carbonaceous fuel downward into the reaction zone of a free-flow partial oxidation gas generator comprising: a central cylindrically shaped conduit having a central longitudinal axis that is coaxial with the central longitudinal axis of the burner; an unobstructed converging exit nozzle that develops into a straight cylindrical portion with a circular exit orifice at the downstream end of the central conduit; closing means attached to the upstream end of said central conduit for closing off same; inlet means in communication with the upstream end of the central conduit for introducing a gaseous feedstream selected from the group consisting of free-oxygen containing gas, steam, recycle product gas, and hydrocarbon gas; a second conduit coaxial and concentric with said central conduit along its length, a coverging exit nozzle that develops into a straight cylindrical portion with a circular exit orifice at the downstream end of the second conduit; means for radially spacing said central and second conduits and forming therebetween a first annular passage which develops into a right annular passage near the downstream end; closing means attached to said second conduit and first annular passage at their upstream ends for closing off same, said central conduit passing through the upstream closed end of said second conduit and making a gastight seal therewith, and inlet means in communication with the upstream end of the second conduit for introducing a pumpable slurry feedstream of solid carbonaceous fuel; a third conduit coaxial and concentric with said second conduit along its length, means for radially spacing said second and third conduits and forming therebetween a second annular passage that develops into a converging frustoconical portion towards the downstream end with a converging angle with the longitudinal axis of the burner in the range of about 15° to 60°; closing means attached to the second annular passage and third conduit at their upstream ends for closing off same, said second conduit passing through the upstream closed end of the third conduit and making a gastight seal therewith, and inlet means in communication with the upstream end of the third conduit for introducing a feedstream of free-oxygen containing gas into said second annular passage; an outer conduit coaxial and concentric with said third conduit along its length, an outer converging nozzle near the downstream end of the outer conduit which discharges through a circular exit orifice at the tip of the burner, means for radially spacing said third and outer conduits and forming therebetween an outer annular passage that develops into a converging frustoconical portion towards the downstream end with portions having a converging angle with the longitudinal axis of the burner in the range of about 15° to 60°; closing means attached to the third annular passage and outer conduit at their upstream ends for closing off same, said third conduit passing through the upstream closed end of the outer conduit and making a gastight seal therewith, and inlet means in communication with the upstream end of the outer conduit for introducing a feedstream of free-oxygen containing gas into said third annular passage; a separate feedstream conduit externally connected to each of said inlet means; and flow rate control means in each of said feedstream conduits for separately controlling the flow rate of the feedstream passing through said feedstream conduits; flanging means attached to the outside surface of said outer conduit for aligning the longitudinal central axis of said burner along the central axis of the gas generator while the downstream end of said burner is passed downwardly through a port in the top of the gas generator; an outer rearwardly extending annular water-cooled chamber of elliptical cross-section encircling the downstream end of the burner; wherein the tips of said central, second and third conduits may be retracted upstream from the outer conduit exit orifice, or may terminate with the outer conduit exit orifice in the same plane perpendicular to the longitudinal axis of the burner; and wherein a cylindrical shaped slurry stream with a gaseous core passes through the front portion of the burner and is impacted by two high velocity streams of free-oxygen containing gas or at high turndown of the burner one high velocity stream of free-oxygen containing gas said impact taking place prior to, at, or downstream from the tip of the burner to provide atomization and intimate mixing of the slurry feed with free-oxygen containing gas.

4,525,176

PREHEATING AND DESLAGGING A GASIFIER

Wolfgang Koog, Pleasantville, N.Y., and Lawrence E. Estabrook, Whittier, Calif., assignors to Texaco Inc., White Plains, N.Y.

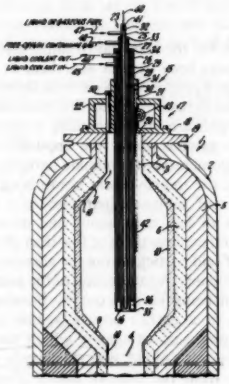
Filed Aug. 29, 1983, Ser. No. 527,611
Int. Cl.[3] C10J *3/08*
U.S. Cl. 48—197 R 13 Claims

1. A process for preheating and deslagging the refractory lined reaction chamber of a vertical free-flow partial oxidation gas generator having a top central inlet passage that terminates at the roof of the reaction chamber, and wherein said reaction

chamber has a refractory lined bottom central coaxial outlet passage comprising:

(1) heating the slag and ash layer on the surface of the refractory lining of said reaction chamber to a temperature in the range of about 1800°–2000° F. by burning a fuel and a free-oxygen containing gas in an elongated burner whose central longitudinal vertical axis is coaxial with that of the gas generator, said burner being supported externally from said reaction chamber and having a downstream end that passes down through said top central inlet passage so that at its initial position the tip of the burner is located at or near the downstream end of the top central inlet passage, and withdrawing the gaseous products of combustion through said bottom central outlet passage while controlling or substantially eliminating the amount of secondary air from the atmosphere that can be drawn through said top central inlet passage;

(2) removing the slag and ash layer from the refractory walls of the bottom central outlet passage and from at least a portion of the refractory lined bottom of the reaction



chamber by lowering said burner into the reaction chamber until the tip of the burner is located above the bottom central outlet passage, continuing said burning so as to increase the temperature of said slag and ash layer to their melting point, or above, at a rate of about 50° to 200° F. per hour, and passing the molten slag and flue gas out through the bottom central outlet passage; and then

(3) continuing said burning and withdrawal of flue gas while slowly raising the burner vertically along the central longitudinal axis of the reaction chamber until the tip of the burner reaches said initial position in the top central inlet passage while simultaneously increasing the temperature of successive portions of any remaining slag and ash layer on the refractory lined bottom of the reaction chamber and the slag and ash layer on the refractory walls of the reaction chamber to their melting point, or above, at a rate of about 50° to 200° F. per hour, and flowing the molten slag down the walls and bottom of the reaction chamber and out through said bottom central outlet passage.

4,525,177

METHOD OF MAKING COATED ABRASIVE DISC

Philip M. Grimes, 15 McMurrich St., Toronto, Ontario, Canada (M5R 3M6), and John R. Grimes, 33 Harbour Sq., Toronto, Ontario, Canada (M5J 2G2)

Filed Mar. 3, 1983, Ser. No. 471,698

Int. Cl.³ B24D *11/00*

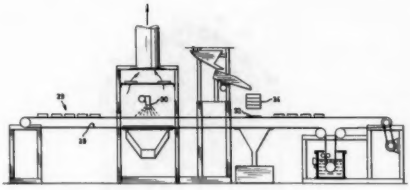
U.S. Cl. 51—295 **3 Claims**

1. A method of making a coated abrasive grinding disc with a resilient thermoplastics material back-up pad comprising the steps of:

making a back-up pad of a resilient moulded thermoplastics material that has resilience to yield to the contour of a workpiece and strength to transmit grinding force to a workpiece in use;

said back-up pad having a work face;

supporting the back-up pad on a support disc that resists warping under conditions of heat encountered in plastics curing with the work face of the pad exposed, and apply-



ing a holding force to secure the back-up pad on the support disc to resist warping;

applying a layer of thermosetting adhesive to the work face of the disc;

applying a layer of abrasive grit into the adhesive;

drying the adhesive at an elevated temperature;

applying a sizing coat of thermosetting adhesive over the abrasive grit; and

curing the thermosetting adhesive at an elevated temperature.

4,525,178

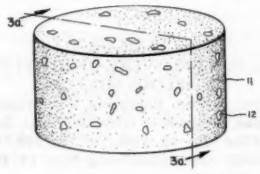
COMPOSITE POLYCRYSTALLINE DIAMOND

David R. Hall, Provo, Utah, assignor to Megadiamond Industries, Inc., Provo, Utah

Filed Apr. 16, 1984, Ser. No. 600,399

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—309 **29 Claims**



1. A composite material comprising:

a mixture of diamond crystals and precemented carbide pieces formed under sufficient heat and pressure to create a composite polycrystalline body in which adjacent diamond crystals are bonded together and to the precemented carbide pieces, and in which the diamond crystals and the precemented carbide pieces are interspersed in one another, either the carbide pieces or diamond crystals providing a matrix for the composite material.

4,525,179

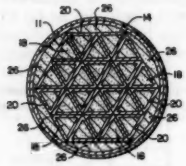
PROCESS FOR MAKING DIAMOND AND CUBIC BORON NITRIDE COMPACTS

Paul D. Gigl, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 487,115, Apr. 27, 1983, abandoned, which is a continuation of Ser. No. 287,010, Jul. 27, 1981, abandoned. This application Oct. 14, 1983, Ser. No. 542,081

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—309 **37 Claims**



1. In a process for preparing a compact which comprises:

A. subjecting a mass of abrasive crystals selected from the group consisting of diamond, cubic boron nitride and mixtures thereof, which mass is in contact with a source of metallic catalyst/solvent for recrystallization of the abrasive crystals, to conditions of temperature, pressure and time which result in a compact having intercrystal bonding between adjacent crystal grains;

B. recovering the compact produced; and

C. removing substantially all of the metallic phase from the compact of step B;

the improvement which comprises:

(i) forming the compact with a sub-divided crystalline mass by embedding within the mass of abrasive crystals at least one metallic partition strip of a given shape subdividing the abrasive crystal mass before the mass is subjected to the temperature and pressure conditions of step A, which partition strip is characterized by maintaining segregation between the separate portions of the abrasive crystal mass throughout step A and being sufficiently pliable not to resist the compaction of the abrasive crystal mass; and

(ii) recovering a compact in step C having a shape described at least in part by the partition strip.

4,525,180

PROCESS FOR RECOVERY OF ETHYLENE FROM GASEOUS MIXTURE

Hidefumi Hirai; Makoto Komiyama, and Susumu Hara, all of Tokyo, Japan, assignors to Hidefumi Hirai, Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,417

Claims priority, application Japan, Mar. 19, 1983, 58-46163; Jul. 16, 1983, 58-129785

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—37 **18 Claims**

1. A process for recovery of ethylene from a gaseous mixture containing ethylene and water or water vapor, said process comprising selectively absorbing ethylene to the exclusion of water or water vapor with a liquid absorbent comprised of a compound selected from the group consisting of silver halide and cuprous halide, an aluminium halide, a polymer selected from the group consisting of polystyrene and polystyrene derivatives, and an aromatic hydrocarbon.

4,525,181

PROCESS FOR THE REMOVAL OF IMPURITIES IN REACTED ALUMINA

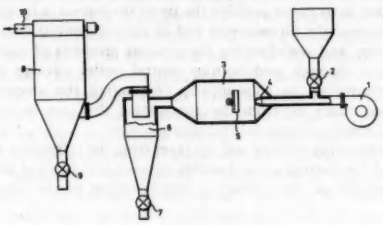
Ole K. Böckman, Oslo, Norway, assignor to Flakt AB, Sweden

Continuation of Ser. No. 339,875, Jan. 18, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 669,045

Claims priority, application Norway, Feb. 5, 1981, 810393

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—71 **9 Claims**



1. In a process for the removal of impurities from alumina crystals which have been used as adsorbent in a dry purification system for purifying waste gases from aluminum electrolysis furnaces for the industrial production of aluminum, wherein said alumina crystals are used essentially to absorb HF which is emitted in the gaseous phase, the impurities being present essentially as agglomerates of sublimate particles in the reacted alumina crystals, the improvement comprising disintegrating the agglomerates of sublimate particles to a dust of finely divided particles of less than about one micron and finely divided agglomerates of particles of less than about one micron with liberation of said particles from the alumina crystals while essentially avoiding any disintegration of the aluminum crystal, the disintegration being carried out by blowing the reacted alumina crystals in a gas/air stream against a substantially transverse impinging surface against which the stream of reacted alumina crystals collide, and selectively separating the alumina crystals from the dust of finely divided sublimate particles and finely divided agglomerates of sublimate particles.

4,525,182

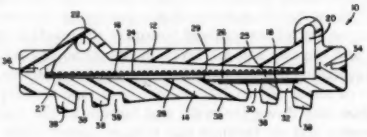
I.V. FILTER APPARATUS

Donald B. Rising, Stow, and Richard G. Naegeli, Jr., Bedford, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Aug. 29, 1983, Ser. No. 527,546

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—159 **10 Claims**



1. A vented filter apparatus comprising a first housing portion and second housing portion, said housing portions being joined together about the periphery of said housing portions, thereby to form a space between said portions, an inlet into said space and an outlet from said space, a liquid wettable membrane positioned on a first surface of said first housing portion within said space to seal said inlet from said outlet, said second housing portion having a first surface and a second surface forming a first space section and a second space section, a liquid non-wettable membrane positioned adjacent said inlet on said first surface of said second housing portion within said

space and spaced apart from said liquid wettable membrane, said first space section being positioned adjacent said non-wettable membrane and being positioned between said liquid wettable membrane and said second surface, said first space section being positioned adjacent said non-wettable membrane, said second space section being in fluid communication with said first space section and having a maximum height between about 2 mm and about 0.05 mm adjacent said inlet and a height less than about 0.3 mm furthest from said inlet, said second surface within said second space section being hydrophilic and at least a portion of the second surface within said second space section positioned opposite the wettable membrane sloping toward the wettable membrane in a direction away from said inlet such that the height of the second space section adjacent said outlet is always smaller than the height of the first space section adjacent said inlet and a gas vent adjacent said liquid non-wettable membrane adapted to permit passage of gas from said first space section through said non-wettable membrane.

4,525,183

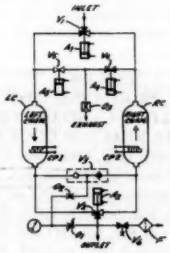
VALVES FOR DESICCANT DRYERS

Harry D. Cordes; Thomas G. Haberer, and Marcel G. Verrando, III, all of Ocala, Fla., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 444,717, Nov. 26, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 551,560

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—179 **15 Claims**



1. A valve for directing gas in a compressed gas desiccant drier system having two desiccant beds which are sequentially placed on stream so that one desiccant bed dries the compressed gas while the other desiccant bed is being regenerated comprising, in combination, a housing having at least two openings to allow for the ingress and egress of compressed gas; a seat for at least one of the openings and integral therewith; a support secured to the interior of the housing and comprising a cylindrical chamber portion in the interior thereof; a rod axially aligned with the seat and being slidably carried by the support, said rod comprising a piston integral therewith and slidably positioned within the cylindrical chamber portion so as to be isolated from the compressed gas, the piston isolating a first portion of the chamber on one side thereof from a second portion of the chamber on the other side thereof; a disc-like sealing member corresponding to each seat sized larger than the passageway through the seat, the sealing member being disposed on the rod and movable with respect to the seat between sealing face-to-face contact therewith to prevent flow of gas through the passageway and a sufficient distance away from the seat to allow substantially unimpeded flow of gas through the valve; and means communicating with each cylindrical chamber portion for introducing to and exhausting fluid from the first and second chamber portions, so that as pressurized fluid is selectively admitted into one chamber portion and exhausted from the other, the piston, rod and sealing member are selectively moved into the sealing and flow-through positions.

4,525,184

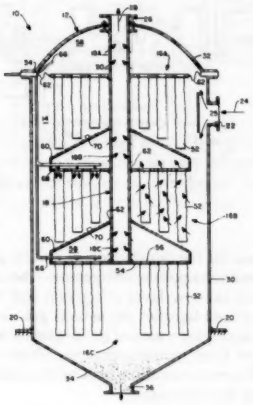
VERTICALLY TIERED PARTICLE FILTERING APPARATUS

Owen J. Tassicker, Cupertino, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 20, 1983, Ser. No. 496,520

Int. Cl.³ B01D *46/02, 29/38*

U.S. Cl. 55—302 **23 Claims**



1. An apparatus especially suitable for filtering out particulate material of a predetermined minimum size from carrier fluid such as flue gases produced by combustion or other such processes, said apparatus comprising:

(a) a main vessel defining an interior compartment and having inlet means through which a particulate laden carrier fluid can pass in order to enter said compartment and separate outlet means through which said carrier fluid, once filtered, can pass in order to leave said compartment;

(b) a single vertically extending outlet pipe disposed within said compartment in a specific position out of the way of said inlet means so as not to prevent said particulate laden fluid from passing into said compartment through the inlet means and cooperating with said outlet means so that the entering fluid, once filtered, must first pass into the pipe before it can leave the vessel compartment through said outlet means, said pipe including a plurality of vertically spaced-apart sections along its length having their own inlet means into the pipe for the passage therein of fluid, once the latter has been filtered;

(c) means for supporting said pipe in said specific position within said compartment;

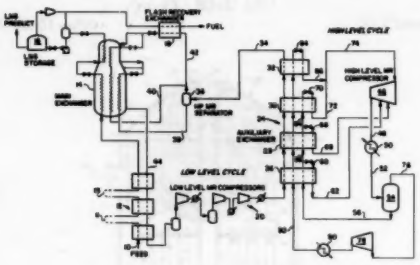
(d) a plurality of vertically spaced filter assemblies, equal in number to said inlet defining pipe sections, connected with and supported substantially solely by said single outlet pipe at spaced-apart locations along the latter adjacent respective ones of said pipe sections but otherwise unconnected with one another, each of said assemblies cooperating with its adjacent inlet defining pipe section for allowing particulate laden fluid within said compartment to enter said pipe through the inlets in said adjacent pipe section while filtering out particulate material of said predetermined minimum size, whereby particulate laden fluid entering the vessels leaves it in a filtered condition.

4,525,185

DUAL MIXED REFRIGERANT NATURAL GAS LIQUEFACTION WITH STAGED COMPRESSION

Charles L. Newton, Bethlehem, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1983, Ser. No. 545,408
Int. Cl.³ F25J 3/00
U.S. Cl. 62—11 **6 Claims**



1. In a process for the liquefaction of natural gas using two closed cycle, multicomponent refrigerants wherein high level refrigerant cools the low level refrigerant and the low level refrigerant cools and liquefies the natural gas, comprising;

cooling and liquefying a natural gas stream by heat exchange with a low level multicomponent refrigerant in a first closed refrigeration cycle, which refrigerant is rewarmed during said heat exchange,

compressing said rewarmed low level refrigerant to an elevated pressure and aftercooling it against an external cooling fluid,

further cooling said low level refrigerant by multiple stage heat exchanger against a high level multicomponent refrigerant in a second closed refrigeration cycle, with high level refrigerant is rewarmed during said heat exchange,

compressing said rewarmed high level refrigerant to an elevated pressure and aftercooling it against an external cooling fluid to partially liquefy said refrigerant, the improvement for varying the composition of the high level refrigerant such that lighter molecular weight components are available to perform the lower level refrigeration duty by;

phase separating said high level refrigerant into a vapor phase refrigerant stream and a liquid phase refrigerant stream,

subcooling and expanding portions of the liquid phase refrigerant stream to lower temperature and pressure in multiple stages to provide the cooling of the low level refrigerant and to cool and liquefy the vapor phase refrigerant stream, and

compressing the vapor phase refrigerant stream and condensing it against an external cooling fluid, before subcooling it against the liquid phase stream and expanding it to lower temperature and pressure to provide the lowest stage of cooling to the low level refrigerant.

5. In an installation for the liquefaction of natural gas using two closed cycle, multicomponent refrigerants wherein high level refrigerant cools the low level refrigerant and the low level refrigerant cools and liquefies the natural gas comprising:

a first heat exchanger for cooling and liquefying natural gas against a low level refrigerant;

at least one compressor for compressing low level refrigerant to an elevated pressure;

an auxiliary heat exchanger for cooling the low level refrigerant against high level refrigerant in multiple stages;

a phase separator for separating the low level refrigerant into a vapor phase stream and a liquid phase stream;

means for conveying the vapor phase stream and the liquid phase stream separately to said first heat exchanger and recycling same to said compressor;

at least one compressor for compressing high level refrigerant to an elevated pressure;

an aftercooling heat exchanger for cooling the compressed high level refrigerant against an external cooling fluid, the improvement for varying the composition of the high level refrigerant such that lighter molecular weight components are available to perform the lower level refrigeration duty including;

a phase separator for separating the high level refrigerant into a vapor phase stream and a liquid phase stream;

a compressor and aftercooling heat exchanger for liquefying said vapor phase stream of said high level refrigerant;

means for conveying said high level vapor phase stream through said auxiliary heat exchanger and expanding said stream in order to cool the low level refrigerant stream;

means for conveying said high level liquid phase stream through said auxiliary heat exchanger including means for separating portions of said stream therefrom and then individually expanding them to a lower temperature and pressure to cool said low level refrigerant, and

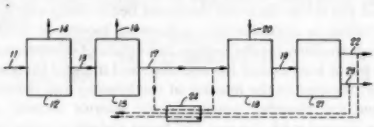
means for recycling the high level refrigerant for recompression.

4,525,186

METHOD FOR PRODUCING ISOTOPICALLY ENRICHED HELIUM-4 AND USE OF SAME AS NUCLEAR REACTOR COOLANT

Leo Garwin, 1512 Camden Way, Oklahoma City, Okla. 73116

Continuation-in-part of Ser. No. 925,158, Jul. 17, 1978, Pat. No. 4,304,634, which is a continuation-in-part of Ser. No. 632,218, Nov. 17, 1975, Pat. No. 4,101,375, which is a continuation-in-part of Ser. No. 307,405, Nov. 17, 1972, abandoned. This application Sep. 28, 1981, Ser. No. 306,009
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.³ F25J 3/02
U.S. Cl. 62—22 **6 Claims**



5. A process for cooling a high-temperature gas-cooled nuclear reactor with enhanced safety and efficiency comprising:

providing a helium feedstock recovered from natural gas;

liquefying said feedstock;

separating by distillation the liquefied feedstock into at least an isotopically enriched helium-4 fraction and an isotopically denuded helium-4 fraction;

passing in heat exchange relation with the liquefied feedstock at least one of said fractions to recover the refrigeration contained in said one fraction;

circulating in said reactor as the coolant, said isotopically enriched helium-4 fraction; and

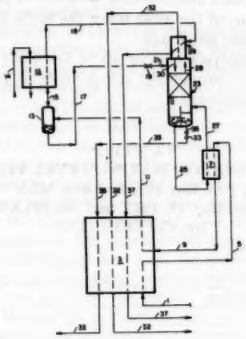
maintaining a concentration of hydrogen gas in said circulating coolant of from about 1 volume percent to about 6 volume percent.

4,525,187

DUAL DEPHLEGMATOR PROCESS TO SEPARATE AND PURIFY SYNGAS MIXTURES

Donald W. Woodward, New Tripoli; Arthur T. Katsaros, Bethlehem, and Howard C. Rowles, Center Valley, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 12, 1984, Ser. No. 579,845
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—31 **24 Claims**



1. A process for separating a high pressure feed gas comprising H_2, CO and C_1+ hydrocarbons into H_2—CO product streams and a C_1+ hydrocarbon stream, said process comprising:

(a) cooling said high pressure feed gas by indirect heat exchange in a high pressure dephlegmator, said feed gas flowing in a generally upward direction to condense and rectify essentially all of the C_1+ hydrocarbons, thereby producing a separate high pressure H_2—CO vapor stream and a high pressure C_1+ enriched liquid stream;

(b) expanding said high pressure C_1+ enriched liquid stream to form a low pressure C_1+ enriched liquid stream;

(c) partially vaporizing the low pressure C_1+ enriched liquid stream to form a low pressure vapor stream and a low pressure C_1+ liquid product;

(d) cooling said low pressure vapor stream by indirect heat exchange in a low pressure dephlegmator using the high pressure H_2—CO vapor stream from the high pressure dephlegmator as a refrigerant by causing said high pressure H_2—CO vapor stream to flow countercurrent to the low pressure vapor stream to condense and rectify essentially all of the C_1+ hydrocarbons, thereby producing a separate low pressure H_2—CO vapor stream and additional low pressure C_1+ liquid product; and

(e) recovering the high pressure H_2—CO vapor stream at a net purity of no more than about 1 mole% of C_1 and higher hydrocarbons, the low pressure H_2—CO vapor stream at a net purity of no more than about 1 mole% of C_1 and higher hydrocarbons, and the low pressure C_1+ liquid product.

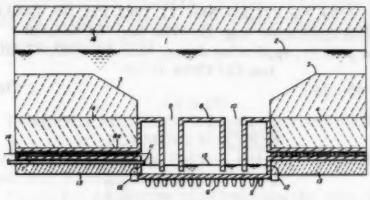
4,525,188

FIBER FORMING BUSHING AND METHOD FOR USING SAME

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 464,233, Feb. 7, 1983, abandoned. This application May 10, 1984, Ser. No. 609,040
Int. Cl.³ C03B *37/09*
U.S. Cl. 65—1 **10 Claims**

2. In a glass fiber forming bushing comprising a container for receiving molten glass including a bottom member having a plurality of orifices therein, four side members and an open top for receiving molten glass the improvement comprising a closure structure positioned above said container having at least one opening therein for the introduction thereto of molten glass, at least one tubular member contiguous with said opening and extending downwardly into said container to a level above the level of the bottom members and below the level of



said sides, means to introduce gas below said closure member and above said container, means to establish pressure in a space provided between said closure and said container to thereby apply pressure to the surface of molten glass introduced into said container and means to cool molten glass in said container when desired.

4,525,189

PROCESS FOR PRODUCING GLASS PRODUCT HAVING GRADIENT OF REFRACTIVE INDEX

Shigeaki Ohmi, Tokorozawa; Seiichi Shingaki; Hiroyuki Sakai, both of Akishima, and Yoshiyuki Asahara, Higashiyamato, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,809
Claims priority, application Japan, May 14, 1982, 57-80124
Int. Cl.³ C03C *15/02*
U.S. Cl. 65—3.15 **7 Claims**

1. A process for producing a glass product having a gradient of refractive indices which comprises:

(a) producing a porous glass body by:

(1) heating a glass body to effectuate a phase separation;

(2) leaching out the acid-soluble phase from said glass body; and then

(3) recovering therefrom the porous glass body;

(b) permeating a solution of dopant comprising $TlNO_3$ and an alkali metal nitrate into the micropores of said porous glass product wherein the concentration of said $TlNO_3$ is between 100 to 400 g/100 ml of H_2O the concentration of said alkali metal nitrate is at least 20 g/100 ml of water;

(c) leaching out a portion of the dopant from the micropores with or without solidifying the dopant in the micropores to form a concentration gradient of the dopant in said porous glass product,

(d) solidifying the dopant in the micropores,

(e) drying the porous glass product,

(f) heat treating said porous glass product to collapse the micropores, and

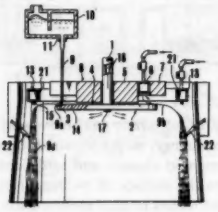
(g) recovering a glass product having Δn greater than 0.04 wherein Δn is the difference between the central and peripheral portions of the glass.

5. The process of claim 1, wherein said dopant further comprises $Pb(NO_3)_2$.

4,525,190
APPARATUS FOR PRODUCING GLASS FIBERS WITH CENTRIFUGAL FORCE

Kyosuke Kawai, Kanagawa; Mitsuru Nakagawa, Tokyo; Shinji Yanase, and Kiyoshi Kawai, both of Kanagawa, all of Japan, assignors to Japan Inorganic Material Co., Ltd., Kanagawa, Japan

Division of Ser. No. 474,348, Mar. 11, 1983, Pat. No. 4,483,699. This application Aug. 22, 1984, Ser. No. 643,310
Claims priority, application Japan, Mar. 17, 1982, 57-42080
Int. Cl.[3] C03B *37/05*
U.S. Cl. 65—14 2 Claims

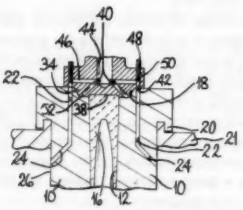


1. An apparatus for producing glass fibers by means of centrifugal force, comprising:
a furnace for melting raw materials for production of glass fibers, said furnace having a flowing-down nozzle at the bottom portion thereof,
a flat rotary disc provided below said furnace, said disc having a peripheral portion with radially engraved grooves coated with a glass layer, for receiving the molten raw materials,
driving means for rotating said disc,
means for jetting combustion gas radially and outwardly onto said peripheral portion of said disc, said means including a ring-shaped burner positioned above said peripheral portion of said disc and being provided with an opening through which the molten raw materials flow down, and
a ring-shaped heat shelter positioned above said disc and inside the ring opening formed by said ring-shaped burner for inhibiting heat flow inwardly along said disc from the molten raw materials.

4,525,191
METHOD OF COOLING A GLASS WARE MOULD

Frank A. Fenton, Wheatley, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 5, 1983, Ser. No. 511,055
Claims priority, application United Kingdom, Jul. 9, 1982, 8219984
Int. Cl.[3] C03B *9/38*
U.S. Cl. 65—83 9 Claims



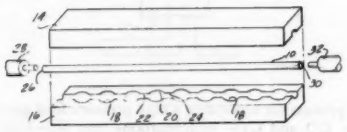
1. An improved method for forming a parison of the type including the steps of guiding a gob of molten glass into a mold cavity of a blank mold through a funnel at a mouth of the mold, blowing or pressing the molten glass to cause it to form the parison wihtin the mold cavity, and closely fitting a baffle over the mouth of the mold to seal the mold during or after forming of the parison, wherein the improvement comprises the step of cooling the parison by blowing cooling air through air passages in the baffle which communicate with air passages in side portions of the mold, said side portion air passages in turn being vented to atmosphere.

7. Apparatus for cooling the blank mold of a glass container forming machine, comprising:
a blank mold comprised of side portions defining a mold cavity, said side portions having air passages therein which are vented to atmosphere;
a baffle which is configured to fit closely to a mouth formed by the side portions of said blank mold, which mouth provides access to the mold cavity, said baffle having air passages which communicate with the air passages in the side portions of the mold when the baffle is fitted to the mouth of said mold; and
means for supplying cooling air to the baffle air passages, and thereby through the side portion air passages to be vented to atmosphere.

4,525,192
METHOD OF MAKING LEVEL VIALS

Herbert Booms, P.O. Box 192, Bad Axe, Mich. 48413

Filed Dec. 15, 1983, Ser. No. 561,836
Int. Cl.[3] C03B *23/08*
U.S. Cl. 65—110 4 Claims

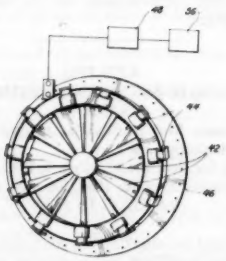


1. A method of making level vials comprising the steps of:
heating an elongated, hollow glass tube;
inserting the heated glass tube into a mold having a plurality of successively spaced, connected mold cavities;
removably sealing one end of the glass tube;
injecting a fluid into the opposite end of the glass tube to expand the glass tube into contact with the walls of the mold cavities thereby simultaneously forming a plurality of vial sections having interconnected, open ends;
simultaneously forming an aperture in each vial section;
simultaneously separating the vial sections; and
simultaneously sealingly closing the open ends of each vial section.

4,525,193
METHOD AND APPARATUS FOR SUPPLYING COOLING AIR IN A GLASS SHEET QUENCH

Ronald A. McMaster, Woodville, and John S. Nitschke, Perrysburg, both of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Nov. 14, 1983, Ser. No. 551,572
Int. Cl.[3] C03B *27/04*
U.S. Cl. 65—114 8 Claims



1. A method for operating an air supply system for a glass sheet quench having a quench cycle and a cooling cycle, the

system including a drive system of a variable speed blower and opposed blastheads which are spaced from each other and supply pressurized gas from the blower to a heated glass sheet positioned between the blastheads, the method including the steps of:

restricting the flow of pressurized gas from the blower when changing the speed of the blower;

operating the blower at substantially full power at a first speed to intially cool the heated glass sheet;

at least partially removing the restriction to permit increased flow of the pressurized gas; and

thereafter operating the blower at less than the full power to further cool the glass sheet, whereby the system supplies the pressurized gas at a pressure to quench the glass sheet at one of said first and second blower speeds during the quench cycle and the system supplies the pressurized gas at a pressure to cool the glass sheet at the other of said first and second blower speeds during the cooling cycle.

6. In an air supply system for a glass sheet quench including a drive system of the variable speed blower and opposed blastheads, which are spaced from each other and supply pressurized gas from the blower to a heated glass sheet positioned between the blastheads, the improvement comprising:

means for restricting air flow from the blower; and

control means for controlling the means for restricting when changing the speed of the blower and then to permit increased flow of the pressurized gas, said control means also controlling the drive system to operate the blower at substantially full pressure at a first speed to supply pressurized gas to quench the glass sheet during the quench cycle; and for controlling the drive system to operate the blower at a pressure reduced from the full pressure at a second speed different from the first speed to supply pressurized gas to cool the glass sheet during a cooling cycle.

4,525,194

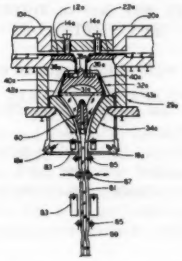
APPARATUS FOR SIMULTANEOUS PRODUCTION OF DOUBLE GLASS PANELS

Boris L. Rudoi, 1170 Chambers Rd., Columbus, Ohio 43212

Continuation of Ser. No. 501,652, Jun. 6, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 650,697

Int. Cl.³ C03B *17/00*

U.S. Cl. 65—145 **7 Claims**



1. An apparatus for the continuous production of glass articles of sheet or tube form comprising in combination, a molding body having an upper and lower portion, said upper portion including a pair of diverging walls forming working surfaces and a reservoir means for receiving a molten glass mass supply disposed above said diverging walls, the overflow of said glass mass from said reservoir means communicating with the upper portion of a respective one of said diverging walls to flow downwardly on said walls; said lower portion of said molding body supporting said upper portion and including an inner cavity having inwardly converging walls means, the upper opening of said cavity being greater than the greatest width dimension between the diverging walls of said upper portion to communicate the glass mass flowing from said upper portion to the converging walls of said lower portion, the lower end of said inwardly diverging walls of said lower portion terminating in an outlet conforming to the approximate shape and size of the glass article to be formed; and a recess in said lower portion forming a second reservoir means extending along the edges of said inner cavity in communication with the glass mass flowing from said diverging walls of said upper portion of said molding body, said recess provided with a lower inner lip which directs the overflow of said glass mass in said recess to the converging walls formed in said lower portion of said molding body.

4,525,195

TAKE-OUT MECHANISM FOR A GLASSWARE FORMING MACHINE

Thomas V. Foster, Cantley, England, assignor to Emhart Industries, Inc., Farmington, Conn.

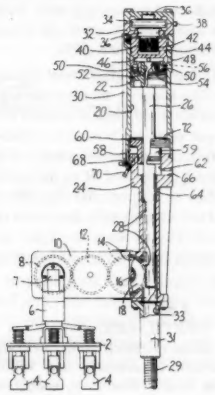
PCT No. PCT/GB82/00046, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02887, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 22, 1982, Ser. No. 433,125

Claims priority, application United Kingdom, Feb. 27, 1981, 8106256

Int. Cl.³ C03B *35/04*

U.S. Cl. 65—260 **4 Claims**



1. A take-out mechanism for a glassware forming machine comprising a tong carrier movable in an arcuate path between a first position at which tongs supported by the carrier can grip an article of glassware and a second position at which the tongs can release the article onto a support, an arm on which the tong carrier is mounted, moving means operable to move the arm arcuately to move the tong carrier along the arcuate path, said moving means including a first piston and cylinder assembly, means defining a selectively activated air supply for said first piston and cylinder assembly to urge the first piston from a first position toward a second position in order to move the tong carrier towards its second position cushioning means comprising, a second piston and cylinder assembly opposing the action of said piston of the first piston and cylinder assembly as said tong carrier approaches its second position, means on the first piston to engage the second piston only when said first piston is at or near its second position, and means continuously supplying air pressure to said second piston and cylinder to urge said second piston in a direction opposite the direction of movement of said first piston as the tong carrier moves toward its second position, whereby, the second piston and cylinder assembly will cause the tong carrier to move away from its second position when the article has been released onto the support and the air supply to the first piston and cylinder assembly is inactive.

2. A take-out mechanism according to claim 1 characterized in that the first piston and cylinder assembly includes a piston

rod extending centrally through the piston of the second piston and cylinder assembly.

4,525,196

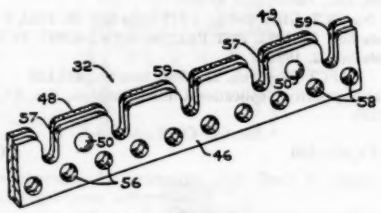
GLASS SHEET HANDLING DEVICES

Michael T. Fecik, Pittsburgh; John J. Ewing, Tarentum, and Edward I. Mates, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 486,653, Apr. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 341,975, Jan. 22, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 644,168

Int. Cl.³ C03B *23/02*

U.S. Cl. 65—287 **6 Claims**



1. Apparatus for handling a hot glass sheet during conveyance comprising a ring-like support member having a surface adapted to engage a heat-softened glass sheet and further having a relatively thin upper edge portion and a relatively thick lower portion, said surface consisting essentially of a phenolic resin reinforced with fibers composed of an aromatic polyamide composition, and means to support said ring-like member in an essentially horizontal orientation with the width of said ring extending essentially vertically to place an upper edge of said ring-like member in position to receive said hot glass sheet.

4,525,197

FERTILIZER

Robert Eibner, Hilden; Hans-Heinrich Nolle, Erkrath bei Dusseldorf; Alfred Schneider, Meerbusch, and Wilhelm Kohl, Nievenheim, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 283,674, Jul. 15, 1981, abandoned, which is a continuation of Ser. No. 97,878, Nov. 27, 1979, abandoned, which is a continuation of Ser. No. 969,525, Dec. 14, 1978, abandoned, which is a continuation of Ser. No. 548,002, Feb. 7, 1975, abandoned. This application Jul. 23, 1982, Ser. No. 401,326

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1974, 2406714; Dec. 17, 1974, 2459585; Dec. 17, 1974, 2459584; Dec. 17, 1974, 2459586

Int. Cl.³ C05G *1/00*

U.S. Cl. 71—11 **6 Claims**

1. In a fertilizer of the type which is in the form of a dispersion of undissolved nutrient materials in aqueous medium containing nutrient materials in solution, the dispersion also containing as dispersing agent a hydrated magnesium-aluminum silicate, the improvement for eliminating the necessity for continuous or regular mechanical blending to avoid formation of large crystals and phase separation during prolonged storing up to 2 or 3 years comprising at least one additional dispersing agent, selected from the group consisting of sorbitol in an amount 0.1 to 5%, polyvinyl alcohol in an amount of 0.1 to 5% by weight, a caseinate in an amount of 0.1 to 5% by weight and a soluble starch hydrolysate in an amount of 0.1 to 8% by weight, the total concentration of said additional dispersing agent amounting to from 0.1 to 14% by weight, relative to the finished fertilizer.

4,525,198

PROCESS FOR THE PRODUCTION OF UREA GRANULES

Willy H. P. Van Hijfte, Assenede, and Luc A. Vanmarcke, Kaprijke-Lembeke, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote, Brussels, Belgium

Continuation of Ser. No. 263,310, May 13, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 474,477

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **4 Claims**

1. In a process for the production of urea granules, wherein an aqueous urea solution having a urea concentration of at least 70% by weight and containing a crystallization retarder for the urea is sprayed in the form of very fine droplets into a fluidized bed of urea particles at a temperature at which the water evaporates from the solution sprayed onto the particles and urea solidifies on the particles to form granules having a desired size, the improvement which comprises employing as the crystallization retarder for the urea in the aqueous urea solution MgO as such or in the form of selectively or completely calcined dolomite in an amount of 0.1 to 2.0% by weight of MgO, calculated on the urea in the solution, said crystallization retarder imparting improved mechanical strength to said urea granules, reducing caking and dust formation during the granulation process and rendering said urea granules compatible with single and triple superphosphate to form bulk blends of fertilizer.

4,525,199

METHOD OF IMPROVED PEST CONTROL

Vithal J. Rajakhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Continuation-in-part of Ser. No. 260,201, May 4, 1981, abandoned, which is a continuation of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jun. 19, 1975, Pat. No. 3,989,816. This application Oct. 13, 1981, Ser. No. 310,948

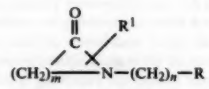
Int. Cl.³ A01N *25/02*

U.S. Cl. 514—788 **15 Claims**

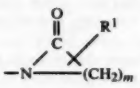
1. An improved method for plant pest control, comprising the steps of:

delivering, as a first ingredient, an effective amount of a plant pesticide to a plant; and

enhancing penetration of the plant pesticide into a target organism associated with the plant, namely a plant, an insect, a fungus, a mollusk, an arachnid, or a nematode, by simultaneously delivering, as a different, second ingredient, a penetration enhancing amount of a compound of the formula:



where R^1 is H or a lower alkyl having 1–4 carbon atoms, m is 5–7, n is 6–17, and R is $—CH_3$ or

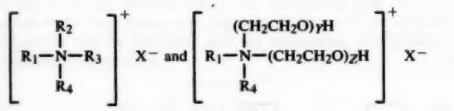


4,525,200
AQUEOUS-SOLUBLE COMPOSITIONS FOR ADJUSTING GROWTH OF ORNAMENTAL AND CROP PLANTS

Masaomi Kimpara, Shizuoka, and Munehiro Suzuki, Toyohashi, both of Japan, assignors to American Cyanamid Company, Stamford, Conn.

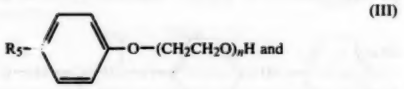
Filed Feb. 22, 1983, Ser. No. 468,441
Int. Cl.³ A01N 25/30
U.S. Cl. 71—76 **10 Claims**

1. A stable, aqueous soluble composition for adjusting growth of ornamental and crop plants, said aqueous soluble composition exhibiting temperature stability at temperatures of −25° C. to 45° C., comprising: about 30% to 75% by weight, of 2-(chloroethyl)trimethylammonium salt, as the active ingredient; a cationic surfactant or mixture of cationic surfactants, having the structural formulae, I and II,

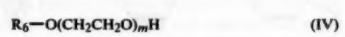


(I) (II)

wherein R_1, R_2 and R_3 are each C_1–C_4 alkyl; R_4 is C_{10}–C_{18} alkyl or alkenyl, and Y is chlorine, bromine, iodine or nitrate; where the sum of (Y+Z) is defined as a range of 2 to 20; a nonionic surfactant or mixture of nonionic surfactants depicted by structural formulae III and IV,



(III)



(IV)

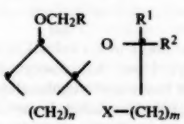
wherein R_5 is C_7–C_{15} alkyl or alkenyl; n is an integer of 6–16; R_6 is C_{10}–C_{18} alkyl or alkenyl; m is an integer of 6–22, wherein the ratio of said cationic to said nonionic surfactants or mixtures thereof is 20/80 to 80/20, and the total cationic and nonionic surfactant combination is about 0.4% to 6.0% of said total composition; a C_1–C_4 alcohol or benzyl alcohol; and sufficient water to total said composition to 100%.

4,525,201
OXASPIRO ALKANE AND ALKENE ETHER HERBICIDES

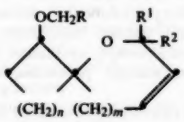
Willy D. Kollmeyer, and Thomas L. Brown, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 24, 1983, Ser. No. 544,762
Int. Cl.³ A01N 43/08, 43/40; C07D 213/06, 307/04
U.S. Cl. 71—76 **11 Claims**

1. A novel compound of formulas I or II



I



II

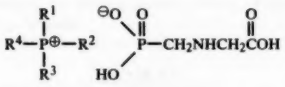
wherein R is an unsaturated group containing up to 4 carbon atoms, a cycloalkyl group containing 3 to 10 carbon atoms, a secondary alkyl group containing 3 to 10 carbon atoms, a phenyl group optionally substituted by 1 or 2 chlorine or fluorine atoms or methyl groups or a 2-pyridinyl group; in formula I, m is 0, 1 or 2; n is 1, 2 or 3; R^1 and R^2 each independently is a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, or a hydroxyalkyl group or an alkoxymethyl group in which the alkyl portion contains 1 to 6 carbon atoms; X is CH_2 when m is 0, 1 or 2 or X is oxygen when m is 1 or 2; or in formula II, n is 1, 2 or 3; m is 0 or 1; and R^1 and R^2 each independently is a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, or a hydroxyalkyl or an alkoxymethyl group in which the alkyl portion contains 1 to 6 carbon atoms.

4,525,202
PHOSPHONIUM SALTS OF N-PHOSPHONOMETHYLGLYCINE AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULANTS

George B. Large, Orinda, and Lawrence L. Buren, Cupertino, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

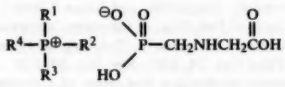
Continuation-in-part of Ser. No. 295,345, Aug. 24, 1981, Pat. No. 4,341,549. This application May 5, 1982, Ser. No. 374,539
The portion of the term of this patent subsequent to Jul. 22, 1999, has been disclaimed.
Int. Cl.³ C07C 9/38
U.S. Cl. 71—86 **32 Claims**

1. A compound having the formula



in which R^1, R^2, R^3, and R^4 are independently selected from the group consisting of C_1–C_{10} alkyl, benzyl, phenyl, substituted phenyl and substituted benzyl wherein said substituents are independently selected from halogen, lower alkoxy, and lower alkyl; provided that at least one of R^1, R^2, R^3 or R^4 is benzyl, substituted benzyl, or substituted phenyl.

25. A method of regulating the natural growth or development of plants which comprise applying to said plants a regulating, non-lethal amount of a compound having the formula



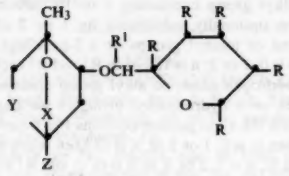
in which R^1, R^2, R^3, and R^4 are independently selected from the group consisting of C_1–C_{10} alkyl, benzyl, phenyl, substituted phenyl, and substituted benzyl wherein said substituents are independently selected from halogen, lower alkoxy, and lower alkyl; provided that at least one of R^1, R^2, R^3 or R^4 is benzyl, substituted benzyl, or substituted phenyl; and an inert diluent carrier.

4,525,203
((3,4,5,6-TETRAHYDRO-2H-PYRAN-2-YL)METHOXY)OXABICYCLOALKANE HERBICIDES

George B. Payne, Modesto, and James E. Powell, Ripon, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 15, 1984, Ser. No. 621,012
Int. Cl.³ A01N 43/00; C07D 407/00, 315/00
U.S. Cl. 71—88 **10 Claims**

1. A compound of the formula



where X is a bond or $-C(CH_3)_2-$; Y is a single bond or $-CH_2-$ with the proviso that both X and Y are not a single bond; Z is a hydrogen atom or, an alkyl group containing 1 to 4 carbon atoms; each R independently is a hydrogen atom, a hydroxy group, an oxo group, a methylene group, or an alkyl or alkoxy group containing from 1 to 6 carbon atoms or one pair of adjacent R groups from a carbon-carbon bond; and R^1 is a hydrogen atom or an alkyl group containing from 1 to 6 carbon atoms.

8. A herbicidal or plant growth regulating composition comprising a herbicidally effective amount of a compound according to claim **1** and at least one carrier or surface-active agent.

9. A method of controlling undesirable plant growth at a locus comprises applying to the locus or the plants an effective amount to control undesirable plant growth of a compound according to claim **1**.

4,525,204

METHOD AND COMPOSITIONS FOR REGULATING PLANT GROWTH USING PYRIMIDINE-BUTANOL COMPOUNDS

Graham Holmwood, Wuppertal, and Klaus Lürssen, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

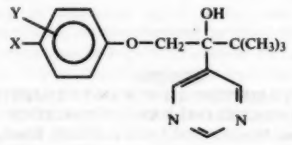
Filed Oct. 24, 1980, Ser. No. 200,170

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944850

Int. Cl.[3] **A01N** *9/22;* **C07D** *239/26*

U.S. Cl. 71—92 **8 Claims**

1. Method for regulating the growth of plants which method comprises applying to the plants and their habitat, an effective amount of a pyrimidine-butanol compound of the formula:



(I)

wherein

X is hydrogen, fluorine, chlorine, methyl, methoxy, and benzyloxy; and

Y is hydrogen or chlorine.

4,525,205

HERBICIDAL COMPOSITIONS COMPRISING COMPOUNDS CONTAINING A PHENYLAMINOPHENOXY MOIETY

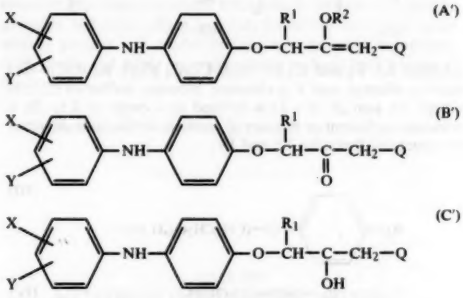
Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 341,736, Jan. 22, 1982, Pat. No. 4,429,167, which is a continuation-in-part of Ser. No. 299,413, Sep. 4, 1981, Pat. No. 4,408,076, which is a continuation-in-part of Ser. No. 270,938, Jun. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 196,795, Oct. 1, 1980, abandoned. This application Mar. 23, 1982, Ser. No. 361,161

Int. Cl.[3] **A01N** *37/36;* **C07C** *101/72*

U.S. Cl. 71—108 **26 Claims**

1. A compound selected from those of the following formulas A′, B′, and C′:



(A′)

(B′)

(C′)

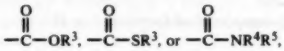
wherein

each of X and Y is independently selected from hydrogen, bromo, chloro, fluoro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, nitro, cyano, trifluoromethyl, chlorodifluoromethyl, fluoromethyl, chloromethyl, and difluoromethoxy;

R^1 is hydrogen or lower alkyl

R^2 is lower alkyl

Q is



in which

R^3 is hydrogen, lower alkyl, lower haloalkyl, lower cyanoalkyl, lower alkenyl, lower haloalkenyl, lower alkynyl, lower alkoxyalkyl, lower dialkylaminoalkyl, lower alkylthioalkyl, lower alkylsulfinylalkyl, lower alkylsulfonylalkyl, tetrahydrofuranylmethyl, tetrahydropyranylmethyl, pyridylmethyl, benzyl, halobenzyl, lower alkylbenzyl, lower alkoxybenzyl, phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl, cycloalkyl, cycloalkalkyl, N-alkylideneamino, sodium, potassium, magnesium or calcium; and

each of R^4 and R^5 is independently selected from hydrogen, lower alkyl, lower hydroxyalkyl, lower alkoxyalkyl or lower alkylsulfonyl.

4,525,206

REDUCTION PROCESS FOR FORMING POWDERED ALLOYS FROM MIXED METAL IRON OXIDES

Stuart L. Soled, Madison, N.J.; Aaron Wold, and Robert Kershaw, both of Providence, R.I., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 564,467, Dec. 20, 1983, abandoned. This application Jun. 15, 1984, Ser. No. 620,943

Int. Cl.[3] B22F 9/00

U.S. Cl. 75—0.5 BA 13 Claims

1. A process for producing a powdered metal-based iron alloy comprising the steps of: (a) heating a mixture comprised of a powdered mixed metal iron oxide, being difficulty reducible in hydrogen gas, with at least a stoichiometric amount of calcium metal, in a non-oxidizing atmosphere, at a temperature below the melting point of the mixed metal iron oxide for a time sufficient to substantially reduce all the metal oxide present, and form said product metal-based iron alloy, as determined by X-ray diffractometry; (b) contacting said reduced mixed metal iron oxide with aqueous acid to remove calcium impurities and by-products; and (c) recovering said product metal-based iron alloy.

4,525,207

PROCESS OF PRODUCING BRIQUETTES TO BE CHARGED TO ZINC-PRODUCING SHAFT FURNACES

Dirk Hankel, Mühlheim, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 339,583, Jan. 15, 1982,. This application Jan. 13, 1984, Ser. No. 570,481

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101886

Int. Cl.[3] B22F 1/02

U.S. Cl. 75—3 7 Claims

1. In a process of producing briquettes to be charged to a zinc producing shaft furnace, wherein a calcine which has been obtained by roasting in a fluidized bed and contains zinc oxide is subjected to hot briquetting, the improvement wherein the calcine has a content of metallic/lead and/or lead oxide corresponding to at least 3% lead, a content of 2 to 6 percent by weight coal consisting essentially of non-caking coal which has a low content of volatile constituents of up to 6 percent, a Pb:C mixture weight ratio of at least 1, and the mixture is briquetted at a compacting temperature of 250° to 470° C. and under an applied pressure amounting to 4 to 20 metric tons per centimeter of the width of the rolls when pressure is dynamically measured.

4,525,208

METHOD FOR RECOVERY OF ZN AND PB FROM IRON AND STEEL DUST

Motohiro Yasukawa; Yukio Ishikawa; Yasuo Ojima; Hiromi Harada, all of Niihama, and Yoshiaki Mori, Sendai, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,763

Claims priority, application Japan, Jul. 26, 1983, 58-137191

Int. Cl.[3] C22B 7/02

U.S. Cl. 75—25 10 Claims

1. A continuous method of recovering zinc and lead from iron and steel dust using an apparatus which includes a rotary kiln, a dust collector, means connecting the dust collector to the rotary kiln, a rotary smelting furnace, means connecting the rotary smelting furnace to the rotary kiln, and heating means located near the rotary smelting furnace, the method comprising the steps of continuously

(a) heating the interior of the rotary smelting furnace with the heating means,

(b) maintaining the temperature within said rotary smelting furnace at 1200° to 1350° C.,

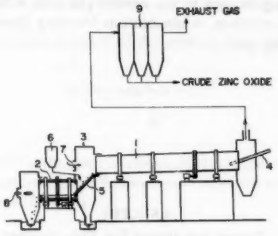
(c) introducing a heated gas into the rotary kiln,

(d) maintaining the temperature within the rotary kiln at 800° to 1000° C.,

(e) adding a reducing agent to the rotary kiln,

(f) adding iron and steel dust with entrained zinc and lead to the rotary kiln so as to form a partially-reduced mass and an exhaust gas containing volatilized zinc and lead,

(g) passing the exhaust gas containing volatilized zinc and lead from the rotary kiln to the dust collector where the zinc and lead are recovered from the exhaust gas,



(h) conveying the partially-reduced mass from the rotary kiln to the rotary smelting furnace,

(i) adding a flux to the partially-reduced mass to form a mixture,

(j) exposing the mixture of step (i) to a reducing atmosphere so as to melt the mixture, thereby effecting volatilization of the zinc and lead retained in the partially-reduced mass, and

(k) discharging the molten mixture of step (j) from the rotary smelting furnace.

4,525,209

PROCESS FOR PRODUCING LOW P CHROMIUM-CONTAINING STEEL

Takashi Yamauchi, Tokuyama; Shigeaki Maruhashi, Kure; Shinkichi Koike, and Keizo Yamada, both of Hachinohe, all of Japan, assignors to Pacific Metals & Co. Ltd. and Nisshin Steel Co. Ltd., both of, Japan

Filed May 2, 1984, Ser. No. 606,182

Int. Cl.[3] C21C 7/00

U.S. Cl. 75—51.5 5 Claims

1. A process for producing a low P chromium-containing steel, in a vessel equipped with a lance adapted to top blowing of oxygen and with at least one tuyere of a double tube structure adapted to bottom blowing of oxidizing and non-oxidizing gases alone or in combination, starting from a chromium-containing molten pig iron which contains not more than 4.5% by weight of C, at least 0.010% by weight of P and at least 3.0% by weight of Cr, said process comprising the steps of:

A. adding a solid carbon source to the chromium-containing molten pig iron in the vessel in an amount sufficient to provide a chromium-containing molten pig iron of a carbon content of at least 4.5% by weight at the end of the step D below,

B. agitating the content in the vessel by bottom blowing thereinto a non-oxidizing gas,

C. blowing oxygen to the molten pig iron to provide a chromium-containing molten pig iron of a temperature ranging between 1500° C. and 1700° C. containing not more than 0.15% by weight of Si and at least 4.5% by weight of C,

D. substantially removing a slag formed in the preceding steps from the vessel,

E. adding a dephosphorization flux to the molten pig iron in the vessel, wherein said dephosphorizing flux comprises 30–80% by weight of at least one compound selected from the fluorides and chlorides of alkaline earth metals, 0.4 to 30% by weight of at least one compound selected from lithium oxide and lithium carbonate, 5–50% by weight of

at least one compound selected from iron oxides and nickel oxide, and 0–40% by weight of at least one compound selected from the oxides and carbonates of alkaline earth metals,

F. agitating the content in the vessel by bottom blowing thereinto a non-oxidizing gas to promote effective contact of the molten pig iron with a slag formed, while maintaining the concentration of iron oxides in the slag at a level of at least 1.0% by weight,

G. substantially removing the slag from the vessel, and

H. blowing oxygen to the molten pig iron in the vessel for decarburization, while bottom blowing thereinto a non-oxidizing gas.

4,525,210

Patent Not Issued For This Number

4,525,211

PROCESS FOR PRODUCING A MICROKILLED STEEL SUITABLE FOR FREERUN CONTINUOUS CASTING FOR SUBSEQUENT COLD FORMING

Luzian Pochmarski; Otto Köller, both of Leoben, and Karl Abendstein, Trofaiach, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 15, 1984, Ser. No. 620,921

Claims priority, application Austria, Jun. 16, 1983, 2219/83

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—58 **12 Claims**

1. A process for producing a microkilled steel suitable for free-run continuous casting for subsequent cold forming, said process comprising standardizing the carbon content of a carbon-containing steel to ≦0.05%, the silicon content to ≦0.05%, the aluminium content to ≦0.006%, the equivalent carbon content being standardized to ≦0.14% according to the equation $C_{eq}=\%C+1/7\%Si+1/5\%Mn+1/7\%Cr+1/20\%Ni+1/9\%Cu+\frac{1}{2}\%Mo+\frac{1}{4}\%V$.

4,525,212

DECONTAMINATION OF ALUMINUM BY CHLORINATION

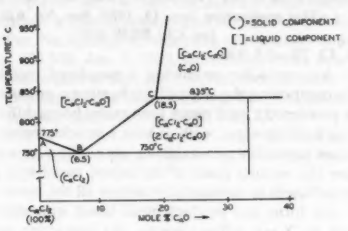
Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1983, Ser. No. 564,569

Int. Cl.³ C22B *21/06, 9/05*

U.S. Cl. 75—68 R **2 Claims**

1. In the process of decontaminating aluminum melt by floating a layer of molten flux atop the surface of the melt and bubbling gaseous chlorine through the melt, the improvement wherein said layer comprises a solution of calcium chloride



and calcium oxide wherein said calcium oxide is sufficient to consume as calcium chloride any chlorine and aluminum chloride evolving from the surface.

4,525,213

COMPOSITION FOR WATERPROOFING AND INHIBITING EROSION AND CORROSION OF SILICON DIOXIDE CONTAINING SUBSTRATES

Michael A. Linn, Omaha, Nebr., assignor to Nox-Crete Chemicals, Incorporated, Omaha, Nebr.

Filed Mar. 2, 1984, Ser. No. 584,879

Int. Cl.³ C09K *3/18*

U.S. Cl. 106—2 **16 Claims**

1. A composition for waterproofing and inhibiting erosion and corrosion of silicon dioxide containing substrates, such as masonry structures, steel reinforced masonry structures and the like, comprising:

from about 7% by weight to about 60% by weight of an alkylalkoxysilane including oligomers and mixtures thereof, having a molecular weight of from about 100 to about 1000; and

a solvent for said silane, selected from the group consisting of C_6 to C_{10} aromatic and cyclic hydrocarbons, or mixtures thereof, said solvent being free of alcohol groups and having a flash point of from 100° F. to about 160° F.

4,525,214

CRAYON ADAPTED FOR DEVELOPMENT OF LATENT IMAGES

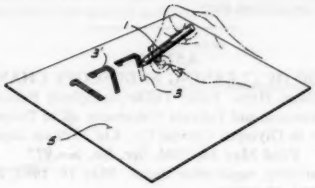
Irving Panken, Dayton, Ohio, assignor to The Mazer Corporation, Dayton, Ohio

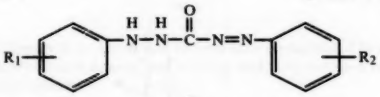
Filed Mar. 11, 1983, Ser. No. 474,289

Int. Cl.³ C09D *11/00;* **B41M** *3/12;* **B41L** *1/20*

U.S. Cl. 106—19 **14 Claims**

1. A crayon adapted for development of a latent image on a substrate by marking thereover, said latent image being comprised of a carboxylic or organic sulfonic acid salt of a metal selected from the group consisting of zinc, mercury, copper, iron, cobalt, aluminum and titanium, and a binder for said salt, said crayon comprising wax, a complexing agent for the ions of said metal, and a solvent for the complexing agent, said complexing agent being selected from the group consisting of diphenylcarbazone and ring substituted diphenylcarbazone derivatives corresponding to the structural formula





where each of R_1 and R_2 is selected from the group consisting of alkyl having between 1 and about 4 carbon atoms, alkoxy having between 1 and about 4 carbon atoms, and hydrogen, said solvent being compatible with said wax.

4,525,215

INK COMPOSITION

Keiko Shioi, and Mikihiko Nakanishi, both of Osaka, Japan, assignors to Sakura Color Products Corp., Osaka, Japan

Filed Apr. 25, 1984, Ser. No. 604,314
Claims priority, application Japan, Apr. 25, 1983, 58-73641
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—22 **9 Claims**

1. An ink composition for writing on an absorbent or pervious writing surface to form thereon a writing or marking composed of an inner portion of a first color with outer contour portions therearound of a second color, which composition comprises:

a polar organic solvent,

a nonpolar organic solvent which is miscible with the polar organic solvent,

a first dyestuff which is soluble both in the polar organic solvent and a mixture of the polar organic solvent and the nonpolar organic solvent, but which is insoluble in the nonpolar organic solvent, and

a second dyestuff which is soluble both in the nonpolar organic solvent and a mixture of the polar organic solvent and the nonpolar organic solvent, the second dyestuff being different in color from the first dyestuff,

whereby the first dyestuff forms in conjunction with the second dyestuff the inner portion of the first color based on the first and the second dyestuffs, and the second dyestuff forms the outer contour portions of the second color based on the second dyestuff around the inner portion.

4,525,216

INK COMPOSITION

Mikihiko Nakanishi, Kawachi-Nagano, Japan, assignor to Sakura Color Products Corp., Osaka, Japan

Filed Oct. 26, 1982, Ser. No. 436,686
Claims priority, application Japan, Nov. 4, 1981, 56-177689
Int. Cl.³ C09D *11/08*
U.S. Cl. 106—30 **8 Claims**

1. An ink composition for a marking pen which consists essentially of:

about 40–90% by weight of a volatile organic solvent;

about 1–10% by weight of a pigment;

about 0.5–30% by weight of a resin which is soluble in the solvent; and

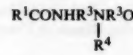
about 0.05–10% by weight of at least one anti-drying additive which is selected from the group consisting of

(a) a glyceride of the general formula

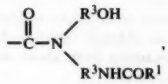
(a)

wherein R^1 represents a fatty acid residue of 7–23 carbons, R^2 represents a mono- or polybasic hydroxycarboxylic acid residue of 1–23 carbons, and n is an integer of 1 or 2,

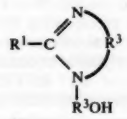
(b) an alkylamide alcohol of the general formula



wherein R^1 is the same as above, R^3 represents an alkylene of 1–4 carbons, and R^4 represents hydrogen or a group of the general formula

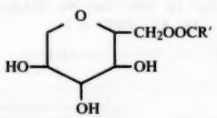


or an intramolecular condensate of the alkylamide alcohol of the formula



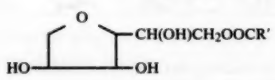
wherein R^4 is hydrogen, or salts of said alkylamide alcohol or intramolecular condensate with fatty acids of 1–8 carbons, and

(c) a sorbitan fatty acid ester of the general formula



(c)

or



wherein R^1 is the same as above.

4,525,217

PROCESS FOR PREPARING FERRIFERROCYANIDE PIGMENTS

Arvind S. Patil, Wyoming; John H. Bantjes, Holland; Louis J. Pepoy, Holland, and Reinhard J. Sappok, Holland, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 2, 1983, Ser. No. 490,364
Int. Cl.³ C09C *1/26*
U.S. Cl. 106—304 **6 Claims**

1. A process for preparing a ferriferrocyanide pigment in the absence of ammonium sulfate in an acidic medium comprising

(a) forming an aqueous reaction mixture comprising

(i) a ferrous salt,
(ii) a compound selected from the group consisting of sulfuric acid, hydrochloric acid, an inorganic potassium salt, and mixtures thereof, and
(iii) an alkali metal ferrocyanide such that the molar ratio of (i) to (ii) to (iii) is about 1:0.9:1 to 1:1.5:1,
(b) oxidizing the acidic solution by aeration;
(c) heating the aerated solution to from 10° C. to 90° C.; and
(d) recovering the pigment.

4,525,218

SELECTIVE HYDROLYSIS OF CELLULOSE TO GLUCOSE WITHOUT DEGRADATION OF GLUCOSE USING ZINC CHLORIDE

Li F. Chen, West Lafayette, Ind., and Che-Ming Yang, Clark, N.J., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 11, 1982, Ser. No. 377,078
Int. Cl.³ C13K *1/02*
U.S. Cl. 127—37 **8 Claims**

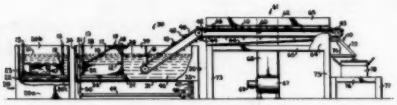
1. A process for the selective hydrolysis of cellulose solids to glucose without degradation of the glucose, which process comprises the steps of:
(a) forming a mixture of cellulose solids together with zinc chloride, said zinc chloride being in the form of an aqueous solution containing from about 60 to about 80% by weight of zinc chloride;
(b) heating the mixture formed in step (a) at a temperature of from about 70° to about 180° C. for a period of time sufficient to convert the cellulose to a liquid form without appreciable formation of glucose;
(c) removing the zinc chloride from the mixture by solvent extraction thereby precipitating the partially hydrolyzed cellulose in the form of cellodextrins; and
(d) separating the precipitated cellodextrins from the extraction media;
(e) hydrolyzing the precipitated cellodextrin to glucose.

4,525,219

AMPULE CLEANING AND QUALITY CONTROL SYSTEM

Larry J. Jones, Overland Park, Kans., assignor to Gard Corporation, Kansas City, Kans.

Filed Apr. 11, 1983, Ser. No. 483,521
Int. Cl.³ B08B *3/12*
U.S. Cl. 134—1 **11 Claims**



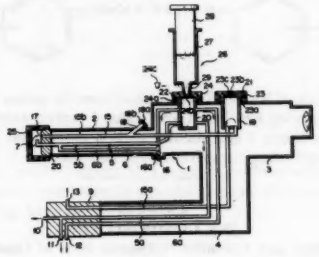
1. A process of cleaning and quality control sifting frangible, sealed, partly filled, floatable ampules comprising the steps of:
(1) placing a number of said ampules in a fluid permeable but fully enclosing container having bottom, top and side walls,
(2) completely submerging the container with said ampules in an ultrasonic cleaning tank and bath containing sufficient liquid therein to completely cover and fill the container whereby the ampules float therein in physical contact with the container top,
(3) transmitting ultrasonic energy into said tank bath in such quantity and in such mode as to both clean the ampules in the container and subject them to sufficient vibrational stress so as to break a substantial percentage of any flawed ampules therein,
(4) removing the container with the cleaned and broken ampules from the ultrasonic cleaning tank bath, and
(5) separating the cleansed intact ampules and the broken ampules from the container and one another in a subsequent separating step.

4,525,220

METHOD OF CLEANING ENDOSCOPE CHANNELS

Hiroyuki Sasa; Hisao Yabe; Yukio Nakajima; Fumiaki Ishii; Koji Takamura, and Takeaki Nakamura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,977
Claims priority, application Japan, May 16, 1983, 58-85552; May 16, 1983, 58-85557
Int. Cl.³ B08B *3/04, 9/00*
U.S. Cl. 134—21 **7 Claims**



1. A method of cleaning channels of an endoscope which includes a control section, an insertion section extending from the control section and having a nozzle at its distal end, a light guide cable extending from the control section and having a connector at its distal end, an air supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, a liquid supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, a suction channel extending in the endoscope and having one end opening to the distal end of the insertion section and the other end opening to the connector, an air/liquid supply valve cylinder arranged in the control section to communicate with the air supply channel and liquid supply channel and having one end opening to the outside of the control section, and a suction valve cylinder arranged in the control section to communicate with the suction channel and having one end opening to the outside of the control section; said method comprising:
a first step of closing one of the open ends of the air/liquid supply valve cylinder and suction valve cylinder;
a second step of mounting connecting means on the distal end of the insertion section so that liquid is confined to flow between the nozzle and said one end of the suction channel; and
a third step of supplying or sucking liquid from the other of the open ends of the valve cylinders and sending the liquid through the three channels, the air/liquid supply valve cylinder and the suction valve cylinder, thereby cleaning the interiors of the channels and valve cylinders with the liquid.

4,525,221

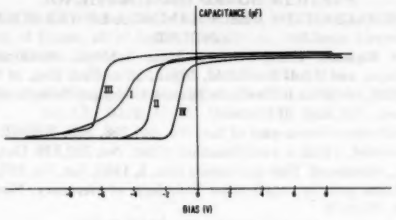
ALLOYING OF ALUMINUM METALLIZATION

Chung P. Wu, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 16, 1984, Ser. No. 610,838
Int. Cl.³ H01L *21/24*
U.S. Cl. 148—1.5 **8 Claims**

1. In a method of heating a structure comprising a silicon substrate and a layer of aluminum metallization at least partially in contact therewith to a temperature sufficient to alloy said contact using heating means that will supply a pulse of

energy such that the structure is heated to alloying temperature for less than one minute and cooled to below about 200° C.



in not longer than about one minute after cessation of heating, the improvement comprising heating said structure in a reducing atmosphere.

4,525,222

METHOD OF HEAT-TREATING AMORPHOUS MATERIAL

Takashi Meguro, Yasugi; Yasunobu Ogata, Kumagaya, and Yoshizo Sawada, Saitama, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 368,867, Apr. 15, 1982, abandoned. This application May 14, 1984, Ser. No. 609,837

Claims priority, application Japan, Apr. 24, 1981, 56-62026

Int. Cl.³ H01F *1/00*

U.S. Cl. 148—121 **3 Claims**

1. A method of heat-treating a Co-base amorphous material having a Curie temperature T_c higher than or equal to the crystallization temperature T_x of said material, comprising a step of holding the amorphous material at a temperature T defined by the following formulae:

$$1.1 \times T_c \geqq T \geqq 0.95 \times T_c$$

and

$$T \geqq T_x$$

for a short time ranging from about 30 seconds to about 3 minutes to enhance the magnetic permeability and to prevent crystallization of said material.

4,525,223

METHOD OF MANUFACTURING A THIN RIBBON WAFER OF SEMICONDUCTOR MATERIAL

Noboru Tsuya, 1-38, Kashiwagi 2-Chome, Sendai, Japan, and Kenichi Arai, Sendai, Japan, assignors to Noboru Tsuya, Sendai, Japan

Continuation of Ser. No. 375,314, May 5, 1982, abandoned, which is a continuation of Ser. No. 55,031, Jul. 6, 1979, abandoned. This application Apr. 9, 1984, Ser. No. 597,565

Claims priority, application Japan, Sep. 19, 1978, 53-114848; Oct. 12, 1978, 53-125485

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **29 Claims**

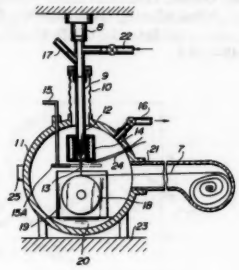
1. A method of manufacturing a thin ribbon of semiconductor material, comprising:

preparing a material essentially consisting of silicon of more than 90 atomic % with less than 10 atomic % of at least one additional element, for improving the properties of a semiconductor, said additional elements being selected from the group consisting of phosphorus, sulfur, boron, arsenic, tellurium, tin, selenium, aluminum, gallium, indium, silver, and bismuth; and a mixture thereof;

heating said semiconductor material to a melt;

ejecting said melt through a nozzle under pressure from 0.01 to 1.5 atm. onto a moving surface of a cooling substrate to cool said melt at a cooling rate of 10^3–10^6° C./sec;

forming a thin ribbon from the group consisting of p-type, i-type or n-type semiconductor material; whereby the thus obtained thin ribbon of semiconductor material has a polycrystalline structure composed of more than 50% of a grain having a grain size of more than 5 μm, a thickness of



5–200 μm, and a sufficient flexibility such that it is windable on a pipe having a diameter of 34 mm without breaking or cracking.

4,525,224

METHOD FOR THE DOPING OF SUPPORTING SILICON PLATES FOR THE MANUFACTURE OF SEMICONDUCTORS

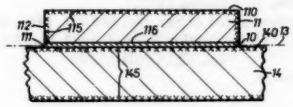
Thomas Vlasak, Birr, Switzerland, assignor to BBC Brown, Boveri & Cie, Baden, Switzerland

Continuation of Ser. No. 353,810, Mar. 2, 1982, abandoned. This application May 22, 1984, Ser. No. 611,930

Claims priority, application Switzerland, Mar. 2, 1981, 1372/81

Int. Cl.³ H01L *21/223*

U.S. Cl. 148—189 **8 Claims**



1. A method for selectively diffusing aluminum into at least a first silicon substrate having a first surface, comprising the steps of:

defining on said first surface a first surface portion to be masked and a first unmasked surface portion;

covering at least said first surface portion to be masked with a first layer of silicon dioxide grown onto said first surface portion to be masked;

additionally covering only said first portion to be masked with a masking plate abutting against said first silicon dioxide layer, whereby said first surface portion to be masked is masked by said silicon dioxide layer and said masking plate;

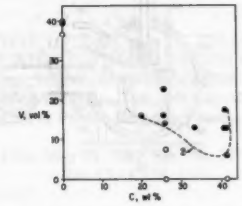
subjecting said first silicon substrate with said first silicon dioxide layer and said masking plate to a source of aluminum impurities under vacuum conditions and at temperatures between 800° C. and 1300° C.; and

diffusing said aluminum impurities into said first silicon substrate at said first unmasked surface portion.

4,525,225
SOLID WATER-IN-OIL EMULSION EXPLOSIVES COMPOSITIONS AND PROCESSES

Michael Cechanski, Nora, Sweden, assignor to Atlas Powder Company, Dallas, Tex.

Filed Mar. 5, 1984, Ser. No. 586,347
Int. Cl.[3] C06B 45/10
U.S. Cl. 149—19.5 31 Claims



1. A solid water-in-oil emulsion explosive composition comprising:

(a) a continuous emulsion phase formed of a solid carbonaceous fuel derived from an oleaginous liquid and providing a self-sustaining matrix;

(b) a discontinuous emulsion phase formed of an aqueous solution of a detonatable oxidizer salt, the water content of said discontinuous phase being present in a concentration by weight which is less than the concentration by weight of said solid carbonaceous fuel;

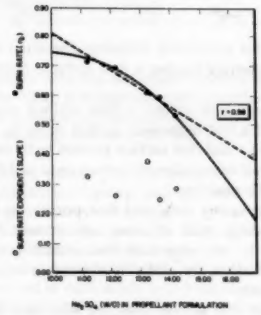
(c) a solid non-hygroscopic oxidizer salt dispersed within said emulsion in a solid granular form; and

(d) void cells dispersed within said emulsion in an amount to provide a void cell volume in said emulsion of at least 5 volume percent.

4,525,226
HIGH YIELD NITROGEN GAS GENERATORS

Glen D. Artz, Canoga Park, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 244,191, Mar. 16, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 421,927
Int. Cl.[3] C06B 35/00
U.S. Cl. 149—35 2 Claims



1. A solid propellant gas generator for producing greater than 50-weight percent pure nitrogen gas comprising a stoichiometric blend of sodium azide, NaN_3, and sodium sulfate, Na_2SO_4, and ballistic modifiers.

4,525,227
PROCESS FOR THE MANUFACTURE OF MULTI-LAYER PARTICLE BOARD USING A PHENOL FORMALDEHYDE RESIN HAVING A LOWER SOLIDS CONTENT

Gerd Ripkens, Kamp-Lintfort; Hans Schittek, Neukirchen-Vluyn, and Adolf Buschfeld, Alpen, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

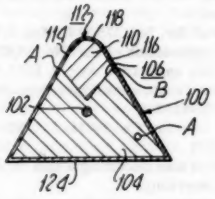
Continuation-in-part of Ser. No. 414,268, Sep. 2, 1982, abandoned, which is a continuation of Ser. No. 202,529, Oct. 31, 1980, abandoned. This application Dec. 5, 1983, Ser. No. 557,785
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944178
Int. Cl.[3] B29J 5/00; B32B 17/00
U.S. Cl. 156—62.2 4 Claims

1. In a process for producing a multi-layer particle board having both an inner layer and an outer layer of glued particle board, the improvement which comprises forming said outer layer by gluing particles together into said outer layer with a resin composition comprising very large molecules formed by the condensation of a sufficient quantity of phenol with formaldehyde or another lower aldehyde having from 1 to 4 carbon atoms to produce a resin composition having a solids content of from about 30 to 39 percent by weight, said resin composition having an alkali content between about 2 and 6 percent by weight and a viscosity of from about 30 to 90 seconds (4-mm DIN cup), said resin composition consisting essentially of the reaction product of said formaldehyde or lower aldehyde, said phenol, alkali and water.

4,525,228
METHOD OF WINDING ON FOAM MANDREL

Dennis H. Bowen, North Stoke, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 4, 1983, Ser. No. 520,234
Claims priority, application United Kingdom, Aug. 13, 1982, 8223388
Int. Cl.[3] B65H 81/00
U.S. Cl. 156—155 11 Claims

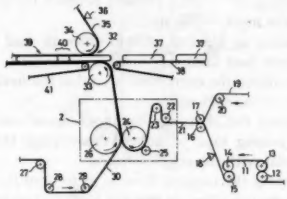


1. A method of producing a fibre-reinforced plastics artefact, comprising the operations of winding filaments onto a mandrel, the filaments being impregnated with a resin and the resin subsequently being cured, wherein the mandrel comprises relatively low density cellular material about a stiff axial spine member, and the method further comprises the operation of removing at least part of the mandrel cellular material from within the artefact after the resin has been partly cured, causing the resin impregnated filaments to conform to the shape of the remaining part of the mandrel, and then completing the curing of the resin.

4,525,229
METHOD FOR ATTACHING ELASTIC BAND TO SANITARY ARTICLES

Migaku Suzuki, Kawanoe; Mitsuzo Ochi, and Satoshi Nozaki, both of Ehime, all of Japan, assignors to UniCharm Corporation, Ehime, Japan

Filed Dec. 14, 1983, Ser. No. 561,479
Claims priority, application Japan, Dec. 15, 1982, 57-219833
Int. Cl.³ B32B *31/08, 31/18;* **A61F** *13/16*
U.S. Cl. 156—161 **9 Claims**



1. Method for intermittently attaching an elastic band, in a stretched condition, with adhesive, to a continuously moving web forming interconnected articles such as sanitary articles on each side thereof longitudinally at predetermined intervals, said method comprising steps of:

(a) continuously or intermittently applying adhesive on the continuously moving elastic band in a stretched condition;

(b) superposing said elastic band on a continuously moving support tape having a sufficiently high flexibility not to hinder a given expansion and contraction ability of said elastic band and a width larger than that of said elastic band and then nipping such assembly between a first pair of nip rollers to form a combined elastic band;

(c) continuously feeding said combined elastic band onto a surface of a rotary suction drum and severing said combined elastic band by a cutter adapted to be opposed to the surface of said suction drum when the latter has rotated by a predetermined angle;

(d) intermittently feeding said combined elastic band which has been severed and isolated on the surface of said suction drum into the predetermined lengths onto each side and longitudinally of the web being continuously fed around a second nip roller placed to be opposed to said suction drum so as to form the interconnected articles; and

(e) severing said web transversely of said web in the areas defined between the longitudinal ends of the respectively adjacent lengths of the severed combined elastic band attached to said web to form the individual articles.

4,525,230
METHOD OF MANUFACTURING A BALLAST RESISTOR SUPPORT MEMBER

Frederick Hetzel, Brookpark, and William G. McCracken, Jr., Highland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 490,745, May 2, 1983, which is a division of Ser. No. 248,550, Mar. 27, 1981, Pat. No. 4,418,328. This application Nov. 5, 1984, Ser. No. 668,683
Int. Cl.³ B32B *5/08*
U.S. Cl. 156—179 **3 Claims**

1. The method of manufacturing a ballast resistor for a gas discharge lamp unit comprising the steps of:

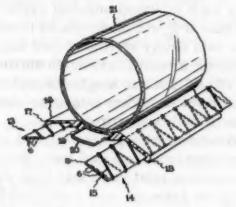
(a) extruding a tube of thermoplastic insulative material through an extrusion die shaped as an oval with a minor axis having sufficient width to permit the introduction of strands of fiberglass within said tube without deforming the shape of the tube;

(b) feeding said strands continuously into said extruded tube after emergence from said extrusion die;

(c) positioning said strands within said tube in a common plane and coextensive with the longitudinal and major axes thereof;

(d) compressing and concurrently cooling said tube to form a substantially flat strip and secure said strands firmly between the opposed walls thereof;

(e) helically winding a restrictive wire uniformly along said flat strip to produce a uniform electrical resistance value



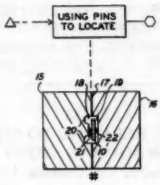
per unit length of said ballast resistor as the result of minimizing both elongation and thickness variation with said placement of the fiberglass strands; and

(f) further extending thermoplastic insulative material around both major surfaces of said wire-wound resistor strip so as to centrally position the strip in said extruded material.

4,525,231
METHOD OF MAKING CUSHIONED AUTOMOTIVE STRAP HANDLE

Jack G. Wnuk, Lapeer, Mich., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Jun. 8, 1983, Ser. No. 502,184
Int. Cl.³ B31C *5/00*
U.S. Cl. 156—185 **15 Claims**



1. A method of making cushioned automotive strap handles having a base strip, a cushion on a side of said base strip, and a cover that is wrapped around said cushion and said base strip and sealed in place, said method comprising:

a. cutting said base strip to length with formed end regions;

b. mounting said formed end regions of said base strip so that a midregion of said base strip spans an injection molding cavity;

c. locating said base strip in a plane spaced from walls of said cavity so that said cavity surrounds said midregion of said base strip;

d. injection molding a resin cladding to surround said midregion of said base strip and provide raised resin shoulders extending along longitudinal side edges of said base strip;

e. using the surrounding engagement of said resin cladding with said base strip to secure said resin shoulders against transverse movement relative to said base strip; and

f. assembling said resin clad base strip with said cushion by wrapping said cover around said cushion and over said raised shoulders and sealing said cover to a seam region of said resin cladding between said shoulders.

10. A method of making cushioned automotive strap handles having a base strip, a cushion on a side of said base strip, and a cover that is wrapped around said cushion and said base strip and sealed in place, said method comprising:

a. index feeding a continuous length of said base strip relative to an injection molding cavity by advancing said base strip when said molding cavity is open and stopping said base strip when said molding cavity is closed so that successive discrete lengths of said base strip span said molding cavity for each injection molding cycle;

b. locating said base strip in a plane spaced from walls of said cavity so that said cavity surrounds said base strip;

c. injection molding a resin cladding to surround a midregion of each of said discrete lengths of said base strip and provide raised resin shoulders extending along longitudinal side edges of said base strip;

d. using the surrounding engagement of said resin cladding with said base strip to secure said resin shoulders against transverse movement relative to said base strip;

e. cutting in regions between said resin claddings to form said base strip to said discrete lengths with formed end regions; and

f. assembling each cut and formed discrete length of resin clad base strip with said cushion by wrapping said cover around said cushion and over said raised shoulders and sealing said cover to a seam region of said resin cladding between said shoulders.

4,525,232

POLYMERIZABLE ACRYLIC COMPOSITIONS HAVING VINYL ETHER ADDITIVE

John M. Rooney, Naas; John Woods, Stillorgan, both of Ireland, and Paul Conway, Bury St. Edmunds, England, assignors to Loctite (Ireland) Ltd., Tallaght, Ireland

Filed Apr. 16, 1984, Ser. No. 600,626

Int. Cl.³ B29C *19/04*

U.S. Cl. 156—273.3 **17 Claims**

1. In a curable composition activatable by a strong acid comprising an acrylic monomer selected from the group comprising di- and poly-(meth)acrylate esters and monofunctional (meth)acrylate esters having a polar group selected from labile hydrogen, heterocyclic ring, hydroxy, amino, cyano, and halogen groups; a peroxy initiator; and a ferrocene compound, the improvement comprising that the composition further comprises from 0.5–20% of a vinyl ether monomer.

4,525,233

IMPROVEMENTS RELATING TO METHOD AND APPARATUS FOR JOINING SHEET MATERIAL

Ronald H. Brooks, 6 Baxter Ct., Chelsea, Vic. 3196, Australia

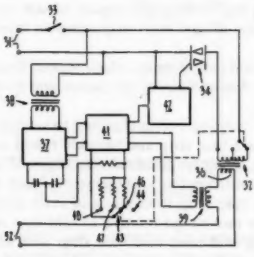
Filed Aug. 23, 1983, Ser. No. 525,651

Claims priority, application U.S.S.R., Dec. 24, 1981, PF2085

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ B32B *31/26*

U.S. Cl. 156—273.9 **6 Claims**



1. A method of joining together edge portions of carpet or other material with a joining tape which has a heat-softenable adhesive and a reinforcing material, said method comprising the steps of:

(a) locating the joining tape beneath the abutting edge portions so that both edge portions are in contact with the adhesive, and so that the reinforcing material overlaps both edge portions,

(b) securing a strip of metal foil to a paper backing material by stitching to form an elongated heating element of a length greater than the length of the opposed abutting edge portions,

(c) locating the heating element beneath the joining tape so that the metal foil is uppermost,

(d) passing an electric current through said metal foil to generate heat therein,

(e) controlling the current flow so that the heat generated at least softens said adhesive,

(f) pressing the abutting edge portions of said sheets onto said joining tape to adhesively engage the reinforcing material with the edge portions;

(g) stopping the current flow so as to cool the joining tape whereby the adhesive thereon sets and bonds the reinforcing material to the edge portions, and

(h) removing the heating element by longitudinally drawing the metal foil and backing material from beneath the formed seam.

4,525,234

ADHESIVE, PRE-GELLED PLASTISOLS AND PROCESS OF PREPARATION

Julius Herold, Monheim, and Ingeborg Geisen, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft (KGaA), Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 519,828, Aug. 2, 1983, abandoned. This application Aug. 21, 1984, Ser. No. 643,090

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1982, 3229656

Int. Cl.³ C08J *5/00;* **C08L** *27/06, 33/12, 31/04*

U.S. Cl. 156—332 **12 Claims**

1. A process for preparing an adhesive, pre-gelled plastisol composition which consists essentially in the steps of:

(a) mixing (1) copolymers of vinyl acetate with comonomers selected from the group consisting of ethylene in a vinyl acetate/ethylene ratio by weight of 80:20 to 40:60, and vinyl chloride in a percent by weight ratio of vinyl acetate to vinyl chloride of 5/95 to 10/90, with (2) conventional non-gelled plastisol mixtures based upon (i) polyvinyl chloride and/or polymethyl methacrylate and (ii) one or more suitable plasticizers in a ratio of about 10 to 200 parts of said copolymers of vinyl acetate to 100 parts by weight of polyvinyl chloride and/or polymethyl methacrylate and in a ratio of about 20 to 400 parts of said plasticizer to 100 parts by weight of said copolymers and said component (i), and

(b) heating the mixture from step (a) to a temperature of from about 80° to 130° C., for a time sufficient to effect pre-gelation.

4,525,235

PAPER AND TAPE DISPENSING APPARATUS

Joseph Todisco, Woburn, Mass., assignor to Marson Corporation, Chelsea, Mass.

Filed Aug. 14, 1984, Ser. No. 640,735

Int. Cl.³ B31F *5/06;* **B32B** *31/18*

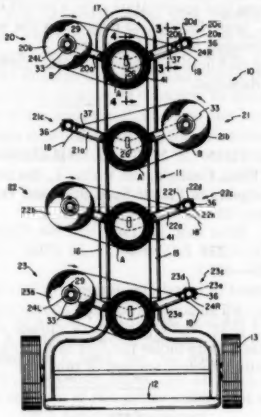
U.S. Cl. 156—511 **5 Claims**

1. An apparatus for dispensing both paper from a roll and tape from a roll to form a paper tape composite which apparatus has a roll of paper and a cutter and paper support comprising

(a) a vertically-oriented frame means positioned on a support surface;

(b) a dispensing unit mounted on the frame means which unit in turn comprises

a pair of spaced-apart projections extending from the frame; each projection being capable of removably receiving a roll of paper or a cutter and paper support means;



a cutter and paper support means attached to one of the projections;

a roll of paper on the other projection; and

a tape roll axle means positioned between such projections for mounting a tape roll thereon to feed tape from the tape roll toward either projection.

4,525,236

DEVICE FOR THE INSERTION OF SMALL BLOCKING STRIPS OR RIBBONS FOR MULTIPLE SHEET MATERIAL

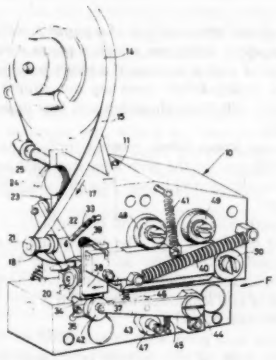
Guido Verdi, Milan, Italy, assignor to BAMA, SpA, Milan, Italy

Filed Mar. 21, 1983, Ser. No. 477,244

Claims priority, application Italy, Mar. 24, 1982, 21308/82[U]

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—517 **17 Claims**



1. An apparatus for the preparation of blocking strips for insertion thereof into groups of mating holes of materials consisting of laterally punched and coupled sheet groups, whereby each strip has a U-shaped configuration and is fixed to the first and to the last sheet of the sheet group by means of adhesive areas provided in the strip itself, comprising:

means for feeding a continuous ribbon to be cut into small strips;

means for the intermittent advancement of said ribbon along a predetermined path;

cutting means operating at a predetermined and adjustable frequency for engaging said ribbon transversely with respect thereto and to the direction of intermittent advancement of the ribbon along said predetermined path so as to cut said strips from said ribbon;

supporting means for said cutting means, means for imparting two concomitantly reciprocating motions to said supporting means comprising first means for imparting to said supporting means a first reciprocating motion in a direction perpendicular to the predetermined path of said advancement direction of said ribbon and second means for imparting to said supporting means a second reciprocating motion in a direction perpendicular to the direction of said first reciprocating motion; and

means for the controlled displacement of a continuous strip of sheets coming from a sheet coupling device provided upstream of a device for the insertion of the blocking strips, said displacement means being engaged by said cutting means carrying therewith a just cut small strip concomitantly with said second reciprocating motion imparting means, whereby no relatively motion exists between said cutting means carrying the cut strip and the upper sheet of the sheet group passing onto said displacement means.

4,525,237

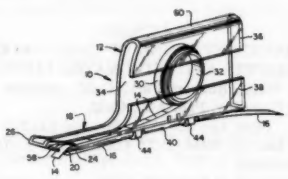
METHOD OF REINFORCING LOOSE-LEAF SHEETS AND DISPOSABLE REINFORCING TAB APPLICATOR THEREFOR

Milton Clar, Bethesda, Md., assignor to Leonard S. Blondes, Bethesda, Md., a part interest

Filed May 24, 1982, Ser. No. 381,318

Int. Cl.³ B44C *1/00, 7/00;* B32B *31/00*

U.S. Cl. 156—540 **10 Claims**



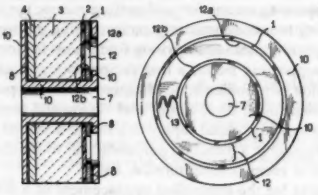
1. A device for applying a reinforcing tab to a sheet in a loose-leaf binder at a region of the sheet between a hole in the sheet through which a ring of the loose-leaf binder passes and an adjacent edge of the sheet, comprising a holder for holding a supply of reinforcing tabs carried on a carrier strip, an elongated member projecting from the holder, the member being sized to fit within the ring of the loose-leaf binder and to position the carrier strip between the edge of the sheet and the hole in the sheet through which the ring passes, a deflecting edge adjacent to one end of the projecting member around which the carrier strip is adapted to be passed to separate a tab therefrom, and applicator means adjacent to the deflecting edge for pressing the separated tab onto the sheet.

4,525,238

PROCESS FOR MANUFACTURING AN ELECTRIC CIRCUIT INTENDED FOR FIRING A PYROTECHNIC DEVICE AND THE CIRCUIT THUS OBTAINED

Claude Flassayer; Bernard Le Grives, and Paul R. Simon, all of Nice, France, assignors to Sfernice Societe Francaise de l'Electro-Resistance, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,464
Claims priority, application France, Dec. 15, 1982, 82 21024
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—645 **4 Claims**



1. A process for manufacturing an electric circuit comprising an electrically resistant element (**13**), (**14**, **1***c*, **15**) for firing a pyrotechnic device, said process comprising the steps of fixing a sheet (**1**) of an electrically resistant material to an electrically insulating support (**3**), etching two conducting zones (**12***a*, **12***b*), (**1***a*, **1***b*) on said sheet, separating said conducting zones by an electrically resistant element (**13**), (**14**, **1***c*, **15**), and covering each of said two conducting zones (**12***a*, **12***b*), (**1***a*, **1***b*) at least partially by a layer (**10**) of a conducting material intended to provide the electric contact with the terminals supplying the electric current to the circuit, this process comprising the following steps:

first applying a fine nickel layer (**6***a*) and then a fine copper layer (**6**) to the sheet (**1**),

piercing a hole (**7**) through said sheet (**1**), support (**3**), fine nickel layer (**6***a*) and fine copper layer (**6**),

depositing a fine copper layer (**8**) on the assembly, depositing a protecting mask (**9**) in the openings etched in the resisting sheet, depositing a copper layer (**10**) of a thickness between 20 and 40 microns and then a tin-lead layer of a thickness between 5 and 15 microns in the hole (**7**) and on the two faces of the assembly,

removing the protecting mask (**9**) and removing the fine copper layer (**8**) protected by the mask (**9**) by chemical action and,

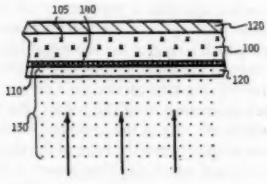
removing the external tin-lead layer (**11**) by chemical action.

4,525,239

EXTRINSIC GETTERING OF GAAS WAFERS FOR MESFETS AND INTEGRATED CIRCUITS

Faa-Ching Wang, Rohnert Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 23, 1984, Ser. No. 602,833
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—645 **7 Claims**



1. A method for isolating imperfections in a GaAs wafer having first and second surfaces, comprising the steps of:

forming an insulating layer over the first and second surfaces;

mechanically treating one of the first and second surfaces to produce a surface damage layer;

heating said substrate in a forming gas to a temperature no higher than a temperature required to maintain the substrate at a semi-insulating condition;

maintaining said temperature over a period of time sufficient for the imperfections to migrate in the substrate toward said damaged surface layer; and

removing said insulating layer over said surface not mechanically damaged.

4,525,240

DISSOLUTION OF METALS UTILIZING TUNGSTEN

Moenes L. Elias, Canfield, and Walter L. Burger, Salem, both of Ohio, assignors to Plastic Specialties and Technologies, Inc., Barrington, Ill.

Filed Aug. 22, 1983, Ser. No. 525,079
Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—659.1 **19 Claims**

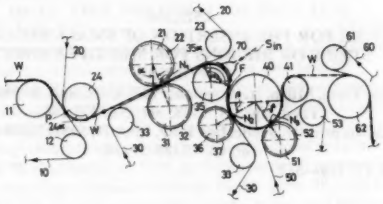
1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of tungsten.

4,525,241

PRESS SECTION OF A PAPER MACHINE

Jorma Laapotti, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Feb. 28, 1983, Ser. No. 470,197
Claims priority, application Finland, Mar. 5, 1982, 820776
Int. Cl.³ D21F *3/04, 9/00, 9/02*
U.S. Cl. 162—301 **19 Claims**



1. A closed press section of a paper machine, comprising:

a first upper fabric on which a paper web from a forming wire of a wire section of a paper machine is carried,

a first double-felted press nip constituted by two hollow-faced rolls through which said first upper fabric and web pass,

a second lower fabric passing through said first press nip which carries the web after said first press nip, the web being dewatered in said first press nip through both of its faces,

a smooth-faced central roll constituting one roll of at least two single-felt nips, the web being detached from said second lower fabric and adhering to the face of said smooth-faced central roll to move therewith into a next one of said single-felt nips which is provided with its own press fabric, and

wherein said press section is devoid of press nips formed with rolls of the suction type, said hollow-faced rolls constituting said first double-felted press nip comprising solid-mantle hollow-faced rolls,

said second lower fabric having a run prior to a first one of said single-felt nips which is turned in a downward direction over a peripheral sector of a roll situated within a

loop of said second lower fabric, said peripheral sector having a magnitude in the range of about 30° to 160°,

wherein the web passes through said first double-felted press nip and said at least two single-felt nips so that the face of the web which did not contact the forming wire of the wire section contacts the smooth face of said central roll in said at least two single-felt press nips, and wherein

said at least two single-felt press nips formed with said smooth-faced central roll include first and second single-felt press nips which are positioned below a horizontal plane passing through the axis of said central roll and load the central roll in an upward direction to compensate for the weight of the central roll, said first and second single-felt press nips constituting means for dewatering the web in a downwardly direction.

4,525,242

DESALTING SYSTEM UTILIZING SOLAR ENERGY

Tomimaru Iida, 5-20-11, Todoroki, Setagaya-ku, Tokyo, Japan

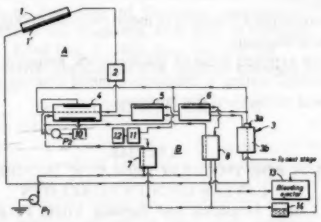
Filed Jul. 9, 1982, Ser. No. 396,827

Claims priority, application Japan, Jul. 31, 1981, 56-119235

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ C02F *1/06, 1/14*

U.S. Cl. 202—177 **5 Claims**



1. A desalting system including a heat collecting circuit and a distillation circuit which comprises in combination:

a solar heat collector provided with a heat collecting pipe therein through which is passed a heat-transfer medium to be heated by solar energy within said heat collector;

means for adiabatically compressing said solar energy heated heat-transfer medium said heat-transfer medium being directed to said compression means via said heat collecting pipe;

means for directing said compressed heat-transfer medium to a first heat exchanger into which seawater is introduced for heating said seawater through the exchange of heat between said adiabatically compressed, solar energy heated heat-transfer medium and said seawater;

means for introducing said seawater into said first heat exchanger;

means for directing said heat-transfer medium, after passing through said first heat exchanger, to a means for adiabatically expanding said heat-transfer medium and for returning said adiabatically expanded heat-transfer medium to said solar heat collector;

means for directing said heated seawater to at least one evaporation means for collecting and separating steam produced from said seawater;

means for directing said steam to at least one additional heat exchanger for condensing said steam into fresh water; and

means for collecting and storing said fresh water.

4,525,243

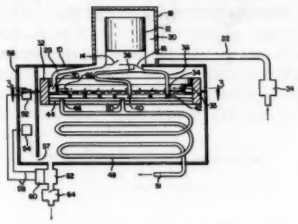
APPARATUS FOR DESALINATING WATER

Stanley Miller, Portland, Oreg., assignor to J. Stanley Miller Corporation, Portland, Oreg.

Filed Mar. 5, 1984, Ser. No. 586,035

Int. Cl.³ B01D *1/28, 3/10*

U.S. Cl. 202—181 **7 Claims**



1. Apparatus for desalinating water comprising

a tank for receiving water to be desalinated and for holding residual water at a selected level,

said tank having upper and lower ends and defining side walls,

a vacuum pump at the upper end of said tank having an inlet communicating with said tank for reducing the interior of said tank to a continuous subatmospheric pressure, to vaporize said water and for heating said water vapors while said water vapors pass therethrough,

said pump also having an outlet,

heat transfer means communicating with said pump outlet for receiving said heated water vapors and being submerged in said tank adjacent a water level in the tank,

heat pickup means adjacent said pump for receiving heat generated by the operation of said pump,

inlet means for water to be desalinated leading through said heat pickup means and providing discharge of inlet water at said heat transfer means above the water level for vaporization by heat from said heat transfer means which have been heated by heat generated by the change in pressure and heating of said pump,

a float within said tank, said heat transfer means being mounted on said float and said inlet means terminating on said float,

and condensing means leading from said heat transfer means for forming a condensate from water vapor forced into said heat transfer means from said pump outlet.

4,525,244

VAPOR RECOMPRESSION REBOILING PROCESS

Jean-Paul Gourlia; Philippe Jacob, both of Lyons, and Robert Jamen, Irigny, all of France, assignors to Elf France, France

Filed Nov. 24, 1982, Ser. No. 444,511

Claims priority, application France, Dec. 4, 1981, 81 22742

Int. Cl.³ B01D *3/02*

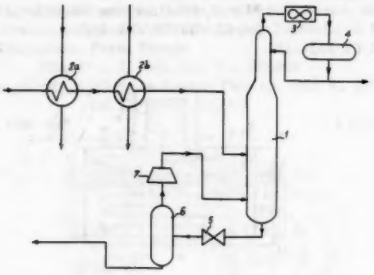
U.S. Cl. 203—26 **5 Claims**

1. A process for reboiling a distillation column operating under pressure in which the products are normally discharged at the top of the column and in which a part of the bottom product is withdrawn from the bottom of the column and provides a low thermal level heat source, characterized in the steps of:

expanding the withdrawn bottom product as a whole in an expansion balloon flask;

withdrawing the liquid fraction resulting from the expansion of the bottom product;

compressing only the vapor fraction of the bottom product from the resulting expansion and;



then reinjecting the compressed vapor fraction into the column to provide a selected reboiling heat.

4,525,245

SEPARATION OF N-BUTYL ACETATE FROM N-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Filed May 7, 1984, Ser. No. 608,040
Int. Cl.³ B01D *3/40*; C07C *67/48*
U.S. Cl. 203—51 **2 Claims**

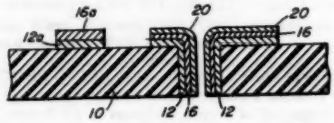
1. A method for recovering n-butyl acetate from a mixture of n-butyl acetate, n-butanol and water which comprises distilling a mixture of n-butyl acetate, n-butanol and water in a rectification column in the presence of an extractive agent, recovering essentially pure n-butyl acetate and water as overhead product and obtaining the extractive agent and n-butanol from the stillpot or reboiler, the extractive agent comprises at least dimethylsulfoxide.

4,525,246

MAKING SOLDERABLE PRINTED CIRCUIT BOARDS

Maurice E. Needham, Andover, Mass., assignor to Hadco Corporation, Salem, N.H.

Filed Jun. 24, 1982, Ser. No. 391,969
Int. Cl.³ C25D *5/02*; H01K *3/42*
U.S. Cl. 204—15 **4 Claims**



1. In a process for making a copper-circuit-bearing printed circuit board of the solder-compatible type wherein circuit board hole barrels and pads around said holes are coated with a quantity of solder sufficient to facilitate making soldered connections to said printed-circuit board, the improvement wherein

a first, thin non-solderable solder layer is electroplated directly over said copper circuit, said first solder layer is covered with a protective mask except in the areas defined by hole pads and hole barrels, and

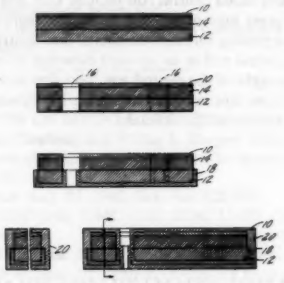
said hole pads and hole barrels are then given a heavier, solder-functional coating of solder before said protective mask is removed from said first solder layer.

4,525,247

MICROWAVE CIRCUIT BOARDS AND METHOD OF MANUFACTURE THEREOF

Rodger P. McMonagle, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 12, 1982, Ser. No. 397,546
Int. Cl.³ C25D *11/08*; H05K *1/09*
U.S. Cl. 204—24 **30 Claims**



1. A method of preparing a circuit board from a laminate of dielectric material sandwiched between layers of copper and aluminum comprising the steps of:

forming at least one through-hole in the laminate;

anodizing the exposed areas of the aluminum layer in H_3PO_4 while electrically isolating the aluminum from the copper;

electroplating a conductive metal over the anodic coating on the aluminum;

etching exposed areas of the dielectric material; and

electroless plating a conductive metal coating over all exposed surfaces of the laminate.

4,525,248

PROCESS FOR THE ELECTROLYTIC DEPOSITION OF LAYERS OF NICKEL ALLOYS

Vaclav Landa, Hrusicka, and Jaromir Vitek, Prague, both of Czechoslovakia, assignors to Stani vyzkumny ustav materoalu, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 242,636, Mar. 11, 1981, abandoned. This application May 27, 1983, Ser. No. 498,957
Claims priority, application Czechoslovakia, Jun. 18, 1980, 4292-80
Int. Cl.³ C25D *5/34, 3/56*
U.S. Cl. 204—29 **9 Claims**

1. A process of cathodic deposition of alloys selected from the group consisting of nickel/molybdenum, nickel/tungsten and nickel/phosphorus, the process comprising degreasing the surface of an object to be metal-plated, activating said surface by rinsing in a sulphosalicylic acid solution, and finally metal-plating said surface in an aqueous sulfo-salicylic acid electrolyte containing nickel as a major ingredient and substances selected from the group consisting of compounds of molybdenum, tungsten and phosphorus in concentrations varying within the range from 0.001 to 0.25×10^3 mol.m^{-3}.

4,525,249

TWO STEP ELECTRO CHEMICAL AND CHEMICAL ETCH PROCESS FOR HIGH VOLT ALUMINUM ANODE FOIL

Mulk R. Arora, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,667
Int. Cl.³ C25F *3/04*
U.S. Cl. 204—129.75 **11 Claims**

1. A two step process for etching aluminum electrolytic

capacitor anode foil wherein such foil has a high cubic texture, greater than 70% cubicity, comprising a first step of:

treating said foil in an electrolyte bath containing between 1.5% and 7% hydrochloric acid and 0% to 2% aluminum as a chloride under the influence of direct current at a temperature between 70° C. and 85° C.; and

passing a charge of 6 to 25 coulombs through said foil while

said foil is immersed in said hydrochloric acid bath and having a current density between 0.25 and 0.6 amperes/cm^2; and

in a second step, treating said foil emerging from said first bath in an aqueous bath consisting of from 2 to 11% nitric acid and between 0% to 3.5% aluminum as aluminum nitrate for a period of 3 to 12 minutes at a bath temperature of 80° to 95° C.

4,525,250

METHOD FOR CHEMICAL REMOVAL OF OXIDE LAYERS FROM OBJECTS OF METAL

Ludwig Fahrmbacher-Lutz, Augsburg, and Klaus Seidler, Baienfurt, both of Fed. Rep. of Germany, assignors to Ludwig Fahrmbacher-Lutz, Augsburg, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,115

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048083

Int. Cl.³ C25D *5/34*; C25F *1/08*

U.S. Cl. 204—58.5 **9 Claims**

1. A method for chemical removal of oxide layers from the surface of objects made of titanium or a titanium alloy prior to subsequent coating of said object with a metal characterized in that the oxide removal treatment is carried out with a mixture of hydrogen fluoride and one or more alkali fluorides and/or ammonium fluoride in a non-aqueous organic solution substantially free of water and oxygen molecules.

2. A method according to claim 1 characterized in that the metal object from which the oxide layer has been removed is then flushed with an inert solvent in an atmosphere free of water vapor and oxygen, and is then promptly coated with a metal coating composition before the surface of said metal object can re-oxidize, said metal coating composition comprising a metal selected from the group consisting of aluminum, copper, nickel, silver, germanium, beryllium, molybdenum, tungsten and zirconium.

4,525,251

PROCESS FOR PRODUCING DIMETHYL ESTERS OF HIGHER DIBASIC ACID

Kazunori Yamataka, and Toshiro Isoya, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP82/00451, § 371 Date Sep. 12, 1983, § 102(e) Date Sep. 12, 1983, PCT Pub. No. WO83/02463, PCT Pub. Date Jul. 21, 1983

PCT Filed Nov. 26, 1982, Ser. No. 536,160

Claims priority, application Japan, May 28, 1981, 56-80016; Jun. 4, 1981, 56-85017; Jan. 12, 1982, 57-2261; Aug. 27, 1982, 57-147810

Int. Cl.³ C07B *29/06*

U.S. Cl. 204—79 **10 Claims**

1. In a process for producing long-chain dimethyl esters of higher dibasic acids, the improvement comprising condensing electrolytically and batchwise a mixture of acid esters consisting of monomethyl adipate or monomethyl glutarate essentially free of glutaric anhydride and glutaric acid and a monomethyl ester of a C_8–C_{11} dicarboxylic acid in a methanolic solution containing alkali metal salts of said acid esters, in a molar ratio of at least 2 of the monomethyl adipate or the monomethyl glutarate essentially free of glutaric anhydride and glutaric acid to the monomethyl ester of a C_8–C_{11} dicarboxylic acid, while keeping the water concentration in said methanolic solution at 0.15–3.5% by weight, wherein said electrolytic condensation is conducted until the sum of concentrations of the monomethyl glutarate essentially free of glutaric anhydride and glutaric acid and the monomethyl ester of a C_8–C_{11} dicarboxylic acid is reduced to 1% by weight or less.

4,525,252

METHOD FOR SYNTHESIZING N_2O_5

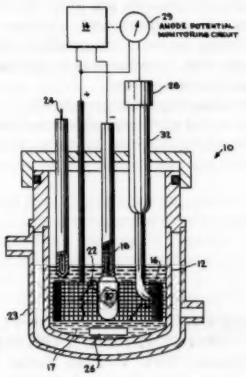
Raymond R. McGuire, Brentwood; Clifford L. Coon, Fremont; Jackson E. Harrar, Castro Valley, and Richard K. Pearson, Pleasanton, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 399,948, Jul. 20, 1982, Pat. No. 4,432,902. This application Oct. 28, 1983, Ser. No. 546,715

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—101 **9 Claims**



1. A method of synthesizing N_2O_5, comprising:

(a) providing an electrochemical cell including an anode disposed in an anode compartment and a cathode disposed in a cathode compartment, said anode and cathode being operatively connected to a power source;

(b) disposing a solution of N_2O_4 and HNO_3 in said anode compartment, and a solution of HNO_3 in said cathode compartment;

(c) applying and maintaining a controlled potential between said N_2O_4/HNO_3 solution and said anode to minimize side reactions; and

(d) thereafter forming N_2O_5 in said anode compartment.

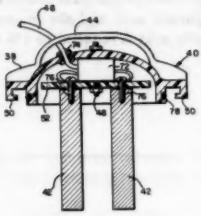
4,525,253
METHOD AND APPARATUS FOR PURIFICATION OF WATER

Daniel F. Hayes; Robert G. Sias, both of Lake Worth; Lloyd Chesney, West Palm Beach, and John W. Waldron, Highland Beach, all of Fla., assignors to MED Products, Inc., Archer, Fla.

Continuation of Ser. No. 466,549, Feb. 15, 1983, abandoned. This application Jun. 28, 1984, Ser. No. 625,718

Int. Cl.³ C02F *1/46*; C25B *11/04*

U.S. Cl. 204—149 **27 Claims**



1. A method for purifying a body of water, comprising the steps of:

circulating the water over two electrodes, the electrodes being solid bars, the water being circulated in a discontinuous path defined by an enclosure for the electrodes, at least one of the electrodes being wired to ground potential through a resistor, at least one of the electrodes comprising an alloy of:

approximately 85% to 93% copper, by weight;

approximately 1.5% to 5% silver, by weight;

approximately 2.5% to 7% nickel, by weight;

simultaneously releasing copper ions and silver ions into the circulating water at concentration levels which are effective to substantially reduce algae and bacteria levels, but which are substantially less than the levels otherwise necessary to be so effective when released independently, by developing an electrical potential between the electrodes, whereby the water may be purified without need for chlorine treatment; and,

sensing and indicating fouling of the electrodes by monitoring the potential of the electrode wired through the resistor, fouling being detected by a drop in said potential.

4,525,254
PROCESS AND APPARATUS FOR PURIFYING EFFLUENTS AND LIQUORS

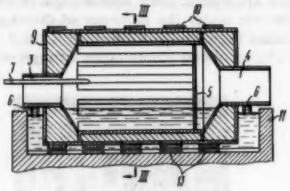
Vitaly A. Feofanov; Boris V. Pilat; Larisa P. Zhdanovich; Anatoly G. Romanenko; Boris S. Lukhanin; Oleg V. Donets, and Valery P. Korobochkin, all of Alma-Ata, U.S.S.R., assignors to Gosudarstvenny Nauchno-Issledovatelsky I Proektny Institut Po Obogascheniju Rud Tsvetnykh Metallov "Kazmekhanobr", Alma-Ata, U.S.S.R.

Filed Oct. 7, 1982, Ser. No. 433,234

Int. Cl.³ C02F *1/46*

U.S. Cl. 204—150 **4 Claims**

1. In a method for purifying effluents and liquors, comprising dissolving a metal anode without applying current from an external source in the presence of a non-soluble cathode made of a material which has a potential higher than the potential of the anode, whereby organic and inorganic impurities are precipitated on the resultant compounds, the improvement consisting of precipitating the impurities as the anode and cathode are alternatively brought in contact with each other, with an



oxygen-containing gas and with the effluents and liquors being treated.

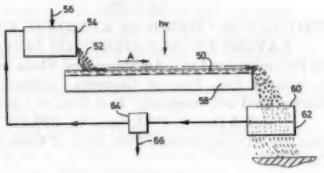
4,525,255
PHOTOCHEMICAL REACTIONS FOR COMMERCIAL SYNTHESIS

James E. Guillet, 31 Sagebrush La., Don Mills, Ontario, Canada (M3A 1X4)

Filed Nov. 16, 1982, Ser. No. 442,181

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **12 Claims**



1. A process for converting at least one photochemically reactive chemical reactant to photochemical reactions products by exposure to solar radiation, which comprises:

providing a carrier which is buoyant on an aqueous liquid medium, and substantially inert to the chemical reactant and the photochemical reaction products;

applying said at least one reactant to the carrier and supporting it thereon or therein;

floating said carrier supporting said at least one reactant on an aqueous medium in which the carrier is substantially insoluble and inert;

causing photochemical reaction of or between said photochemically reactive chemical reactant or reactants, without the involvement of the supporting aqueous medium therein, by exposing the carrier-supported reactant or reactants to solar radiation while the carrier floats on the aqueous liquid medium;

and recovering from the inert carrier photochemical reaction products obtained from said reactant or reactants.

4,525,256
PHOTOPOLYMERIZABLE COMPOSITION INCLUDING CATALYST COMPRISING DIKETONE PLUS 4-(N,N-DIMETHYLAMINO)BENZOIC ACID OR ESTER THEREOF

Brian Martin, Princeton Junction, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Jul. 1, 1983, Ser. No. 510,134

Int. Cl.³ C08F *2/48*, *2/50*

U.S. Cl. 204—159.18 **10 Claims**

1. A photopolymerizable composition comprising at least one olefinically unsaturated compound and a catalytically effective amount of a photosensitive system consisting essentially of:

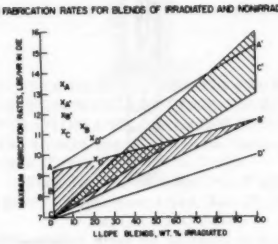
(a) an effective amount of at least one vicinal diketone compound; and
(b) an effective amount of 4-(N,N-dimethylamino)benzoic acid or lower alkyl ester thereof.

4,525,257

LOW LEVEL IRRADIATED LINEAR LOW DENSITY ETHYLENE/ALPHA-OLEFIN COPOLYMERS AND FILM EXTRUDED THEREFROM

Stuart J. Kurtz, Martinsville, and James E. Potts, Millington, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 27, 1982, Ser. No. 452,937
Int. Cl.³ B29F 3/06; C08F 2/46
U.S. Cl. 204—159.2 **36 Claims**



1. A polyethylene composition comprising a narrow molecular weight distribution, substantially linear, low density, copolymer of ethylene and one or more alpha-olefins said copolymer prior to crosslinking having a ratio of weight average molecular weight to number average molecular weight of between about 1 and 10 and being predominately free of long chain branching, said copolymer being crosslinked to an extent sufficient to be free of significant gelation and to provide increased extensional viscosity and substantially equivalent high shear viscosity when compared with the corresponding non-crosslinked narrow molecular weight distribution substantially linear, low density copolymer of ethylene.

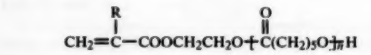
4,525,258

RADIATION-CURABLE RESIN COMPOSITION

Shoji Watanabe, and Kiyoshi Okitsu, both of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 7, 1983, Ser. No. 464,253
Claims priority, application Japan, Feb. 5, 1982, 57-18004
Int. Cl.³ C08J 3/28; C08L 63/10, 67/06, 75/04
U.S. Cl. 204—159.23 **7 Claims**

1. A radiation-curable resin composition comprising 0.1 to 10 parts by weight of a photosensitizer and 100 parts by weight of a mixture of 40 to 95 wt% of a resin having a molecular weight of at least 300 and at least one ethylenically unsaturated group in the molecule and 60 to 5 wt% of ε-caprolactone modified 2-hydroxyethyl acrylate of methacrylate of the formula:



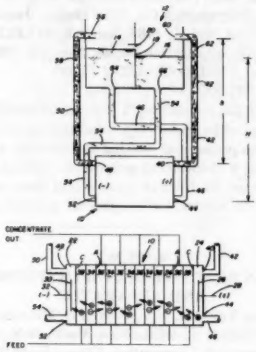
wherein
R=H or CH_3 and
n is 1 to 10.

4,525,259

METHOD AND APPARATUS FOR ELECTRODIALYSIS

Richard E. Horn, and Bradley D. Rodeheaver, both of Pittsburgh, Pa., assignors to Electrochem International, Inc., McDonald, Pa.

Filed Nov. 10, 1983, Ser. No. 550,600
Int. Cl.³ B01D 13/02; G01N 27/28
U.S. Cl. 204—182.4 **11 Claims**



1. A method of electrodialysis in electrodialysis apparatus having ion selective permeable membranes defining a stack of chambers including concentrating chambers containing a concentrate liquid and diluting chambers containing a dilute liquid, said diluting chambers positioned between said concentrating chambers, a pair of electrode compartments including a cathode chamber positioned at one end of said stack with a cathode positioned therein and an anode chamber positioned at the other end of said stack with an anode positioned therein, and a direct current source connected to said electrodes which includes,

maintaining a dilute liquid in a pair of chambers adjacent to said pair of electrode chambers to prevent ion migration from the concentrate liquid in said concentrating chambers into said electrode chambers, one of said chambers being a diluting chamber and the other of said chambers being an idling chamber, said idling chamber containing a dilute solution and having a membrane of the same ion permselective type on the side away from the electrode compartment as on the side of said electrode compartment,

circulating liquid from said cathode chamber to a first reservoir and from said first reservoir to said anode chamber,

circulating liquid from said anode chamber to a second reservoir and from said second reservoir to said cathode chamber, and

maintaining electrical isolation between said reservoirs and said anode and cathode chambers while recirculating liquid between said anode and cathode chambers.

4,525,260

CATHODIC ELECTROCOATING COMPOSITION COMPOUNDED WITH LATEX BINDER AND POSSESSING ENHANCED GLOSS

Kirk J. Abbey, Cleveland, Ohio, and James R. Erickson, Katy, Tex., assignors to SCM Corporation, New York, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,620
Int. Cl.³ C25D 13/06
U.S. Cl. 204—181.7 **7 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode, and an aqueous electrodepositable composition wherein net unidirectional electric current is passed through said circuit for causing deposition of said com-

position on said cathode and the resulting electrodeposit is baked to cure it, said method being characterized by using as said composition one that comprises synthetic, cation-active, film-forming, amino-stabilized latex particles having latex microgel content that is no substantially above about 2%.

4,525,261

SPUTTERING METHOD

Hiroshi Hotta, and Yoshiharu Suzuki, both of Fuji, Japan, assignors to Polyplastics Co. Ltd., Osaka, Japan

Filed Nov. 1, 1983, Ser. No. 547,812
Claims priority, application Japan, Nov. 17, 1982, 57-201410
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 EC **11 Claims**

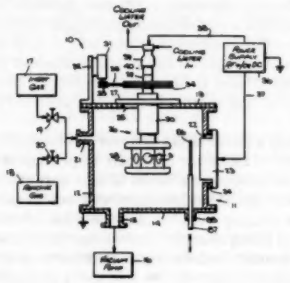
1. A method for metallizing a polyacetal molded article on the surface thereof by sputtering, which comprises the steps of: first coating the polyacetal molded article with a primer solution comprising a chlorinated polyolefin resin and a chlorine-containing solvent to dissolve therein said resin and then sputtering a metal on the treated polyacetal molded article.

4,525,262

MAGNETRON REACTIVE BIAS SPUTTERING METHOD AND APPARATUS

Walter H. Class, Yonkers, N.Y.; Steven D. Hurwitt, Park Ridge, N.J., and Michael L. Hill, New York, N.Y., assignors to Materials Research Corporation, Orangeburg, N.Y.

Continuation of Ser. No. 342,977, Jan. 26, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,449
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **18 Claims**



1. A method of reactive film deposition which includes the steps of providing a metallic coating source and at least one substrate on a substrate support in a hermetic chamber so that a surface of the substrate is exposed to the coating source, evacuating the chamber, introducing at least a reactant gas into the chamber, activating said coating source to emit metallic particles for deposition on said exposed substrate surface, and applying a bias voltage to the substrate support sufficient to ionize the reactant gas for reacting with the metallic particles from said metallic coating source deposited on the substrate, wherein the improvement comprises:

providing a magnetic field having lines of force which leave the substrate support, extend across the surface of the substrate exposed to the coating source, and re-enter the support to enclose said exposed substrate surface in a magnetic electron-trapping field, the strength of said magnetic field decreasing with distance from said exposed substrate surface, and

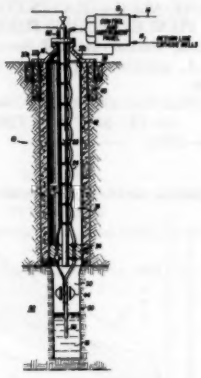
adjusting the bias voltage to be sufficient to produce a dense localized glow discharge containing reactive gas ions and being disposed closely adjacent to said substrate, such that the reaction rate of said gas with the metallic particles deposited on the substrate is increased without a corresponding increase in back sputtering from the substrate.

4,525,263

METHOD FOR CLEANING A CORROSION PROTECTION ANODE

Warren E. Parkhurst, 445 Albrecht La., Durango, Colo. 81301, and David Moser, 14276 Holt Ave., Santa Ana, Calif. 92705

Division of Ser. No. 575,625, Jan. 31, 1984,. This application Nov. 2, 1984, Ser. No. 667,684
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—196 **1 Claim**



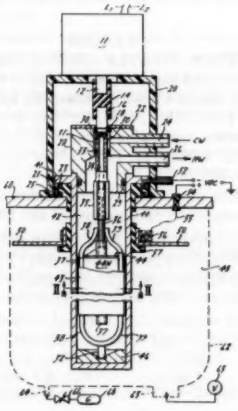
1. A method of cleaning an earth installed liquid anode comprising the steps of reducing the pressure at the liquid anode to thereby allow earth liquids to be driven around the liquid anode and thereafter collecting the earth liquids at the surface of the anode and ejecting them away from the anode.

4,525,264

CYLINDRICAL POST MAGNETRON SPUTTERING SYSTEM

David W. Hoffman, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1981, Ser. No. 327,971
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **4 Claims**



1. A system for sputtering within a vacuum chamber containing a partial pressure of an ionizable gas including:

means providing a generally cylindrical closed surface cathode having a defined length dimension and the outer portion of said closed surface containing material to be sputtered therefrom:

means defining an anode adjacent said cathode;

means for generating a biasing voltage potential and providing connection of said potential between said cathode means and said anode means;

means mounted within said closed surface cathode means for generating a magnetic field oriented to define a closed loop electron confinement tunnel over the length of said cathode;

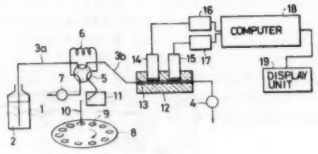
said magnetic field generating means including at least two flexible magnets each having oppositely disposed surfaces of opposite polarity adjacently wrapped around a support mandrel so that for each magnet one of said oppositely disposed surfaces faces the mandrel while the other surface is exposed and adjacent exposed surfaces are of opposite polarity, and the joint between the adjacent surfaces defines said closed loop electron confinement tunnel.

4,525,265

ELECTROCHEMICAL SENSOR CAPABLE OF DETERMINING HYDROGEN PEROXIDE CONCENTRATION AND ANALYZER USING THE SAME

Yumiko Abe, Hitachi, and Kenji Yasuda, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1984, Ser. No. 571,947
Claims priority, application Japan, Jan. 21, 1983, 58-7333
Int. Cl.³ C12Q *1/58*
U.S. Cl. 204—403 **11 Claims**



1. An analyzer including a urea-nitrogen-determining sensor having an enzyme membrane of immobilized urease and an electrochemical sensor arranged in a common flow passage, said electrochemical sensor comprising an electrically insulating body, a hydrogen peroxide-permeable membrane fitted to the body, said body holding an electrolyte therein, and a work electrode and a counter electrode both of which are disposed in said body, said counter electrode being made of a palladium-containing conductive material, whereby use of said palladium-containing conductive material as the counter electrode avoids deactivation of the urease by the material of said counter electrode.

4,525,266

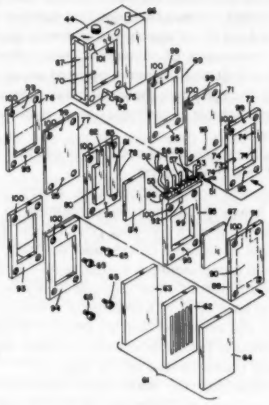
ELECTROCHEMICAL GAS SENSOR

John C. Schmidt, Baltimore; Donald N. Campbell, Timonium, and Sandra B. Clay, Baltimore, all of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 13, 1983, Ser. No. 541,630
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—412 **15 Claims**

1. An electrochemical gas sensor comprising a sensing electrode, a reference electrode and a counter electrode, said counter electrode being made of carbon, said sensing electrode, reference electrode and counter electrode are spaced apart, and

a nonaqueous electrolyte in contact with said electrodes and in the space between said sensing electrode and each of said counter electrode and said reference electrode, said



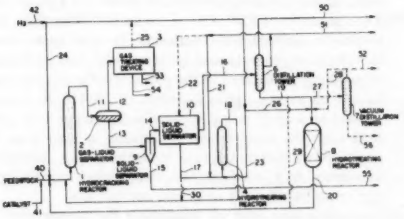
electrolyte including n-methyl-2-pyrrolidone and at least one conductive salt.

4,525,267

PROCESS FOR HYDROCRACKING HYDROCARBONS WITH HYDROTREATMENT-REGENERATION OF SPENT CATALYST

Masayoshi Inooka, Yokohama, Japan, assignor to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

PCT No. PCT/JP81/00134, § 371 Date Sep. 23, 1982, § 102(e) Date Sep. 23, 1982, PCT Pub. No. WO82/04441, PCT Pub. Date Dec. 23, 1982
PCT Filed Jun. 9, 1981, Ser. No. 432,942
Int. Cl.³ C10G *47/30, 65/12;* B01J *23/94, 23/92*
U.S. Cl. 208—58 **24 Claims**



1. A residuum conversion process comprising the steps of:

hydrocracking, in a first zone, a heavy hydrocarbon oil at a temperature of 350°–500° C. and a partial pressure of hydrogen of 10–350 Kg/cm² in the presence of a first catalyst which is maintained in a fluidized state, which contains at least one hydrogenation-active metal component selected from the group consisting of the metals of Groups Ib, IIb, IIIa, IVa, Va, VIa and VIII, manganese and tin and which has a volume mean particle size of not greater than 50μ wherein toluene insoluble carbonaceous materials are disposited on the first catalyst;

discharging at least part of the first catalyst on which toluene-insoluble carbonaceous materials are deposited from said first zone as spent catalyst;

hydrotreating, in a second zone, at least part of the spent catalyst at a temperature of 350°–450° C. and a partial

pressure of hydrogen of 30–350 Kg/cm^2 in the presence of a liquid hydrocarbon and in the further presence of a second catalyst having an average pore diameter of 20–150 Å, a specific surface area of 50 m^2/g or more and a larger bulk volume than said first catalyst and containing at least 5 wt % of one or more metals selected from the group consisting of vanadium, molybdenum, tungsten, nickel, cobalt and copper supported on an acidic carrier, thereby to regenerate the spent catalyst by solubilizing the toluene-insoluble carbonaceous materials deposited thereon; and

recycling the regenerated catalyst to said first zone as at least part of said first catalyst.

17. A process for hydrocracking heavy petroleum oils, wherein a heavy petroleum oil containing at least 80% of heavy components with a boiling point of 350° C. or higher, at least 200 ppm of soluble metals and no more than 0.1% of insoluble solid components, is hydrocracked in the presence of a fluidized catalyst for converting said heavy oil into a light oil containing at least 30% of a fraction of a boiling point of 350° C. or lower and no more than 20 ppm of soluble metals and being substantially free of n-heptane insoluble asphaltenes, said process being characterized by the steps of:

(a) hydrocracking the above-mentioned feed oil under a partial pressure of hydrogen of 30–250 kg/cm^2 and at a temperature of 400°–480° C., using, as the fluidized catalyst, a first finely particulate catalyst having a volume means particle size of 0.1–50μ in a concentration of 0.1–5 wt %, said first catalyst containing at least one hydrogenation-active component selected from the group consisting of metals of Groups Ib, IIb, IIIa, Va, IVa, VIa and VIII, maganese and tin;

(b) separating at least 10% of spent catalyst contained in the product oil of said hydrocracking by solid-liquid separation;

(c) separating the product oil containing the remainder of the spent catalyst into a light oil substantially free of the spent catalyst and a heavy oil containing the spent catalyst;

(d) dispersing at least part of the spent catalyst separated in step (b) in the light oil separated in step (c) having a boiling point of at least 200° C. or a hydrotreated oil thereof, subjecting the dispersed spent catalyst to a hydrotreatment under a hydrogen pressure of 30–250 kg/cm^2 and at a temperature of 350°–450° C. to solubilize at least part of insoluble carbonaceous materials in said spent catalyst thereby to regenerate said spent catalyst, said hydrogeneration being performed in the pressure of a second catalyst having an average pore diameter of 20–150 Å, a specific surface area of 50 m^2/g or more and a larger bulk volume than said first catalyst and containing at least 5 wt % of one or more metals selected from the group consisting of vanadium, molybdenum, tungsten, nickel, cobalt, copper and composited with an acidic carrier; and

(e) recycling said light oil containing the regenerated catalyst to step (a), if necessary along with at least part of the heavy oil obtained in step (c).

22. A process for hydrocrcking heavy hydrocarbon oils containing insoluble solids whereby tar sand bitumen or oil tar with an insoluble solid content of at least 0.2%, or a residue separated therefrom is hydrocracked in the presence of a fluidized catalyst, said process comprising the steps of:

(a) hydrocracking the feed oil using, as the fluidized catalyst, a first catalyst under a hydrogen pressure of 30–250 kg/cm^2 and a temperature fo 400°–480° C., said first catalyst containing at least one hydrogenation-active metal component selected from the group consisting of the metals of Groups Ib, IIb, IIIa, IVa, Va, VIa and VIII, manganese and tin and which has a volume mean particle size of not greater than 50μ;

(b) subjecting the product oil of the hydrocracking to a high gradient magnetic separation to effect separation of magnetizable solids composed of insoluble solid components with high iron and vanadium contents from the product oil;

(c) separating from said product oil a light oil fraction substantially free of insoluble solids;

(d) dispersing at least part of said solids separated in step (b) in the light oil obtained in step (c) and having a boiling point of at least 200° C. or a hydrotreated oil thereof, the resulting dispersion being subjected to a hydrotreatment in the presence of a second catalyst under a hydrogen pressure of 30–250 kg/cm^2 and at a temperature of 350°–450° C. for solubilizing the carbonaceous materials deposited on said solids, said second catalyst having an average pore diameter of 20–150 Å, a specific surface area of 50 m^2/g or more and a larger bulk volume than said first catalyst and containing at least 5 wt % of one or more metals selected from the group consisting of vanadium, molybdenum, tungsten, nickel, cobalt and copper and composited with an acidic carrier;

(e) recycling the thus hydrotreated solids so as to serve as the catalyst in step (a).

4,525,268

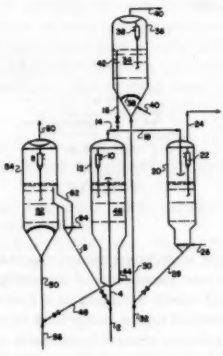
COMBINATION PROCESS FOR UPGRADING RESIDUAL OILS

Dwight F. Barger, Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 401,059, Jul. 23, 1982, abandoned. This application Nov. 10, 1983, Ser. No. 550,985

Int. Cl.^{3} C10G *51/02*

U.S. Cl. 208—73 **11 Claims**



1. A method for converting heavy residual oil feeds comprising metallo-organic compounds boiling above 1050° F. to produce gasoline boiling products which comprises,

A. contacting said residual oil feed for less than about two seconds in substantially plug flow with solid sorbent fluid particle material in a first transport zone at an elevated temperature and for a time sufficient to demetallize and decarbonize said residual oil feed and thermally visbreak multi-ring compounds boiling above 1050° F. to vaporous material boiling below 1050° F., separating vaporous materials from solid sorbent particle material,

B. thereafter immediately contacting said separated vaporous material with an active high temperature crystalline zeolite cracking catalyst discharged by a standpipe to form a flowing suspension in plug flow therewith in a second lateral transport reaction zone above the first transport zone at a temperature within the range of 1050° F. to 1350° F. for a period of time less than about 3 seconds,

C. discharging the suspension in said second transport zone downwardly into a product vapor-catalyst separation zone, recovering vaporous products of said zeolite cata-

lyst cracking operation separately from catalyst particles in said product separation zone,

D. regenerating said solid sorbent particles material and recycling said material for contact with additional heavy oil feed.

4,525,269

PROCESS FOR THE SOLVENT DEASPHALTING OF ASPHALTENE-CONTAINING HYDROCARBONS

Masaki Ikematsu; Isao Honzyo, and Kazuo Sakai, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 454,831, Dec. 30, 1982,. This application May 3, 1984, Ser. No. 606,718

Claims priority, application Japan, Jan. 8, 1982, 57-999; Apr. 2, 1982, 57-53695; Apr. 2, 1982, 57-53696; Apr. 2, 1982, 57-53933; Apr. 2, 1982, 57-53934

Int. Cl.[3] C10G *21/00, 29/16*

U.S. Cl. 208—309 8 Claims

1. A continuous process for solvent deasphalting asphaltene-containing hydrocarbons which consists of (I) mixing

(A) 100 parts by weight of asphaltene-containing hydrocarbons with

(B) 0.005–0.8 parts by weight per 100 parts by weight of said asphaltene-containing hydrocarbons of at least one metal compound selected from the group consisting of carbonates and oxides of magnesium, calcium, aluminum and titanium and

(C) 50–2,000 parts by weight per 100 parts by weight of said asphaltene-containing hydrocarbons of at least one member selected from the group consisting of the following solvents (1)–(4):

(1) aliphatic and alicyclic hydrocarbons having 3–20 carbon atoms,

(2) saturated aliphatic and saturated alicyclic monohydric alcohols having 1–10 carbon atoms,

(3) liquid hydrogen sulfide and

(4) liquid carbon dioxide to form a mixture of the materials (A), (B) and (C) and then (II) making the thus formed mixture stand still to precipitate and separate the asphaltene therefrom thereby obtaining a deasphalted oil.

4,525,270

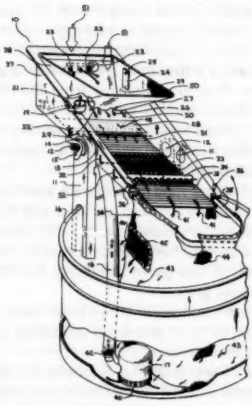
MINERAL SEPARATING PROCESS AND APPARATUS

John C. McCann, 4034 Agua Dulce Blvd., La Mesa, Calif. 92041

Filed Apr. 11, 1983, Ser. No. 483,634

Int. Cl.[3] B07B *9/00*

U.S. Cl. 209—44 9 Claims



1. Mineral separating apparatus comprising:

an elongated sluice box having a bottom wall, a pair of laterally spaced side walls and a rear wall;

a feed hopper having a front wall, a sloping rear wall, and laterally spaced side walls, said front wall and said rear wall being connected together at their bottom ends and having a plurality of primary apertures laterally spaced along the bottom edge where they meet;

said feed hopper being mounted in said sluice box with the top edge of the rear wall of said feed hopper being adjacent the rear wall of said sluice box whereby the rear wall of said sluice box and the rear wall of the feed hopper form an angular cavity;

the bottom edge of said feed hopper being spaced upwardly a predetermined distance from the bottom wall of said sluice box so that a predetermined volume of water can flow through said angular cavity in a predetermined period of time;

the rear wall of said feed hopper having at least one secondary aperture therein adjacent its top edge, an inlet baffle mounted along the back surface of the rear wall of said feed hopper at a position behind said secondary aperture for the purpose of deflecting water directed upwardly against said inlet baffle through said secondary aperture into the interior of said feed hopper;

a water inlet aperture formed in the bottom wall of said sluice box at a position beneath the inlet baffled of said feed hopper whereby water under pressure directed through said water inlet aperture will hit said inlet baffle thereby directing part of it forwardly through said secondary aperture into the interior of said feed hopper; and

means positioned along the top surface of the bottom wall of said sluice box for trapping heavy mineral particles that have been separated from a slurry mixture.

4,525,271

SCREENING APPARATUS FOR GRAINS, SEEDS OR THE LIKE MATERIALS OR GRANULES

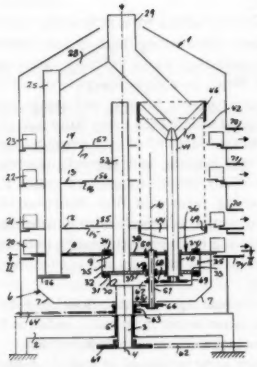
Ole Ewald, Odense, Denmark, assignor to Damas Maskinfabrik A/S, Faaborg, Denmark

Filed Jan. 27, 1984, Ser. No. 574,515

Claims priority, application Denmark, Feb. 3, 1983, 446/83

Int. Cl.[3] B07B *1/26*

U.S. Cl. 209—303 6 Claims



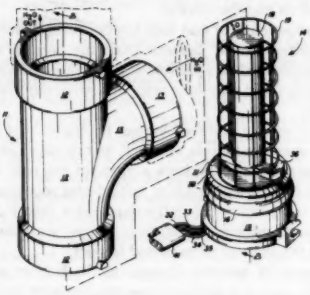
1. Screening apparatus for grains, seeds or the like material or granules, comprising a housing wherein a frame structure is arranged which is adapted to be rotated about a main axis and supports rotatable screening means eccentrically arranged with respect to said axis, and means to vary the eccentricity of said screening means with respect to said axis.

4,525,272

ELECTROCHEMICAL IONIZATION SYSTEM FOR PURIFYING WATER

James H. Henson, Phoenix, Ariz., assignor to Swimaid, Inc., Scottsdale, Ariz.

Filed Feb. 21, 1984, Ser. No. 581,823
Int. Cl.[3] C02F 1/46
U.S. Cl. 210—149 6 Claims



1. Apparatus for purifying water, said apparatus comprising

(a) a hollow housing including a first end and a second end;

(b) a platform member sealingly secured in said first end of said housing;

(c) an anode attached to a base and projecting into said housing away from said platform member and said first end toward said second end of said housing, said anode being comprised substantially of copper;

(d) a wire mesh cathode

(i) attached to said platform member and projecting into said housing away from said platform member and said first end toward said second end of said housing,

(ii) circumscribing and spaced apart from said anode,

(iii) substantially composed of iron,

said housing including a wall having an opening formed therethrough, said wall circumscribing said wire mesh cathode,

(e) a conduit attached to said housing to direct a flow of water into said housing through said opening in said wall thereof such that water entering said housing from said conduit flows in a first direction of travel through said wire mesh cathode toward said anode and said platform member and is deflected away from said platform member and from said first end of said housing toward said second end of said housing in a second direction of travel, the change of direction of travel of water flowing through said housing from said first direction of travel to said second direction of travel causing turbulent intermixing of water passing through said housing to increase the volume of water passing between and contacting said anode and cathode;

(f) means for causing current to flow between said anode and cathode when water from said conduit is flowing through said housing, said current flow causing

(i) oxygen to be produced at and elements in the water to plate out on said iron electrode, the removal of elements from said water depriving algae therein of a food source and said oxygen promoting the oxidation and decay of bacteria and algae in the water,

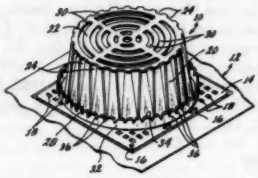
(ii) said copper electrode to produce a concentration of copper ions in the water, said copper ions killing algae and bacteria in the water.

4,525,273

DRAIN GRATE WITH ADJUSTABLE WEIRS

Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 271,501, Jun. 8, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 508,141
Int. Cl.[3] E03F 5/06
U.S. Cl. 210—164 3 Claims



1. In a self supporting foraminous grate for a drain structure an improvement which comprises:

said grate having an exterior and an interior, said exterior of said grate communicating with the ambient environment, said interior of said grate communicating with said drain structure such that fluid in the interior of said grate passes into said drain structure;

a portion of said grate formed as a mounting base, said base sized and shaped to attach to said drain structure maintaining said grate on said drain structure;

a portion of said grate formed as a generally upwardly projecting wall integrally formed with and extending upwardly from said base, said wall formed as a continuous surface of revolution;

a portion of said grate formed as a top surface integrally formed on the uppermost periphery of said wall, said top surface including a plurality of openings in said top surface;

a portion of said grate formed as a guard lip integrally formed with and extending upwardly from said base and culminating in a top edge, said guard lip retarding the flow of solid material towards said wall, said guard lip radially displaced outwardly from wall;

a plurality of weirs located in said wall forming a fluid passageway from the exterior of said grate into the interior of said grate;

said weirs located in said wall in a symmetrical array around the surface of revolution of said wall, each of said weirs shaped as an elongated triangle with the base of each said triangle located proximal to said top surface and the apex of each of said triangles located proximal to said base so as to allow fluid at a first fluid level on said wall proximal to said base to flow at a first rate from the exterior of said grate into the interior of said grate and fluid at a second fluid level on said wall displaced upwardly from said base from said first fluid level to flow at a second rate which is greater than said first rate;

said wall includes a fluid imperforate area located on said wall and extending between said base and the apex of each of said triangular shaped weirs, said imperforate area forming a dam wall between the exterior of said grate and the interior of said grate inhibiting fluid flow into the interior of said grate;

said guard lip is continuous around said wall;

said top edge of said guard lip including a plurality of notches located therein;

said top edge of said guard lip is located at a height greater than said apex of each of said triangular shaped weirs;

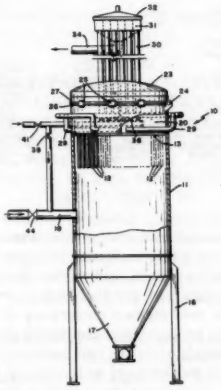
said notches in said guard lip are V-shaped and the lowest most portion of said notches are of a greater elevation from said base than is said apex of each of said weirs.

4,525,274

FILTRATE DISCHARGE SYSTEM FOR PRESSURE FILTER

Charles A. Willus, Newtown; Vaino J. Kosonen, West Redding, both of Conn., and Dale R. Sanchez, Orillia, Canada, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 6, 1984, Ser. No. 597,780
Int. Cl.[3] B01D *29/24, 29/38*
U.S. Cl. 210—232 9 Claims



1. In a filtration device for filtering a liquid from a solids slurry solution and concentrating a solids underflow therefrom, a cylindrical tank housing a plurality of filter elements suspended from a support plate, a filtrate chamber above said support plate and comprising individual filtrate compartments each for receiving filtrate from a selected number of said filter elements, and said filtrate compartments separated one from the other within said filtrate chamber by radially arranged panel members mounted on said support plate, a filtrate discharge system for said device comprising,

(a) a filtrate discharge outlet from each of said filtrate compartments at the periphery of said cylindrical tank,

(b) filtrate collecting means located outside said tank for receiving filtrate under pressure from said filtrate compartments and including a pressure head box mounted above said tank,

(c) a plurality of filtrate receiving boxes provided in said pressure head box equal in number to the number of said filtrate compartments in the filtrate chamber,

(d) a separate flow pipe connection between each of said filtrate discharge outlets and a filtrate receiving box in said head box, and

(e) valve means for each of said flow pipe connections for opening or closing the flow path between a selected filtrate compartment and its associated filtrate receiving box.

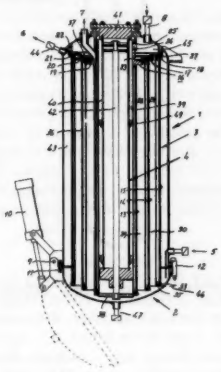
4. The device of claim 1 wherein said cylindrical tank is provided with a removable dome cover and wherein said radially arranged panel members have lower edge portions mounted on said filter element support plate and upper edge portions in sealing engagement with the undersurface of said dome cover in closed position thereof to prevent flow of filtrate between adjacent filtrate compartments in said filtrate chamber.

4,525,275

CONCENTRIC FILTER ELEMENTS

Gunnar Ostlund, Mjölby, Sweden, assignor to Aktiebolaget Svenskt Mjolsocker, Mjolby, Sweden

Filed Mar. 7, 1983, Ser. No. 472,769
Claims priority, application Sweden, Mar. 8, 1982, 8201436
Int. Cl.[3] B01D *29/26*
U.S. Cl. 210—323.2 7 Claims



1. A filter assembly particularly adapted for use with liquids which are difficult to filter, said filter assembly comprising a cylindrical filter container including an inlet for the liquid to be filtered and an outlet for a filtrate, and a filter unit contained within said container, said filter unit comprising a plurality of separate filter elements formed as individual units which are mounted substantially concentrically within said filter container, and which are axially displaceable with respect to said filter container, each said filter element comprising an inner jacket and outer jacket, and at least the inner jacket being perforated and supporting a filter means, a filtrate chamber being provided between said jackets and at least one drain tube extending into said filtrate chamber for enabling draining of the filtrate therefrom, said filter assembly further including a means defining a simple opening for exposing each separate filter element for inspection and cleaning without disassembling the filter assembly.

4,525,276

APPARATUS FOR SEPARATION OF IMMISCIBLE LIQUIDS

Shozo Toda, Fujisawa; Kenji Yasuda, and Shozo Kokubo, both of Tokyo, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,545
Int. Cl.[3] B01D *31/00*
U.S. Cl. 210—433.2 8 Claims

1. A liquid separator which comprises,

a first bottle-like vessel having a mouth,

a second bottle-like vessel having a mouth,

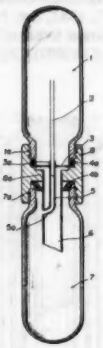
connector means for connecting the mouths of said vessels together and for disconnecting the vessels from each other,

seal means for sealing said mouths with respect to said connector means,

a porous membrane supported by said connector means between the mouths of said vessels, said porous membrane forming a partition between said vessels having a porosity and surface characteristics to permit a liquid to pass therethrough; and

an air passage tube extending between and communicating the interior of said first vessel with the interior of said

second vessel, to enable gas to be displaced from said second vessel to said first vessel as liquid flows from said



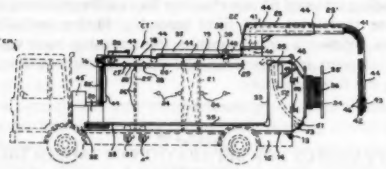
first vessel to said second vessel through said porous membrane.

4,525,277

METHOD FOR CLEANING A SEPTIC TANK

Maurice Poulin, 1559, 50ième Ave., Ste-Lucie des-Laurentides, Canada (J0T 2J0)

Filed Mar. 12, 1984, Ser. No. 588,318
Claims priority, application Canada, Jan. 13, 1984, 445281
Int. Cl.³ B01D *00/00*
U.S. Cl. 210—601 **22 Claims**



1. A method for cleaning a septic tank comprising at least two successive fermentation and decantation compartments connected to each other by means of a lateral opening, each compartment containing a bacteriological liquid medium and a layer of heavy sludges sedimented or not in its bottom, the first one of said successive comparments also containing a layer of light sludges floating on the surface of its bacteriological liquid medium, said method comprising the successive steps of:

pumping the light sludges floating on the surface of the bacteriological liquid medium contained in the first compartment and discharging them into a waste tank;

slowly pumping the bacteriological liquid medium contained in each of the compartments, and storing it into a storage tank;

semi-liquifying the heavy sludges sedimented in the bottom of each of the compartments;

pumping the so semi-liquified sludges and discharging them into said waste tank; and

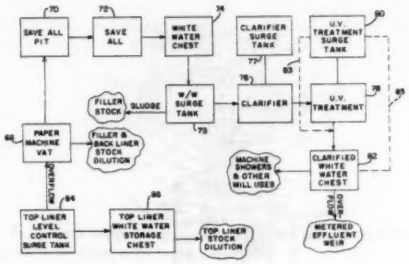
reintroducing the bacteriological liquid medium store in said tank into all the compartments of the tank.

4,525,278

METHOD OF TREATING CHEMICAL PROCESS WATER

Arthur W. Frost, III, Park Ridge, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 13,088, Feb. 21, 1979, Pat. No. 4,221,634. This application Sep. 9, 1980, Ser. No. 185,485
Int. Cl.³ C02F *1/44, 1/32*
U.S. Cl. 210—638 **6 Claims**



1. A method of treating industrial process water having therein a given, first concentration of dissolved organic materials characterized by a relatively simple molecular structure, and a given molecular weight, said method being operative to reduce the concentration of said dissolved organic materials in said process water, said method comprising at least intermittently exposing said process water containing said first concentration of said materials of simple structure to ultra-violet light of such wavelength and intensity as is required for initiating a chemical reaction, including polymerization reactions, among said organic materials, allowing said polymerization and other reactions to continue until reaction products thereof are created which have a molecular weight substantially greater than said given molecular weight, and thereafter collecting said reaction products from said process water, and periodically removing said collected products so as to maintain in said process water a reduced concentration of said dissolved organic materials in relation to said given, first concentration thereof, subjecting at least a portion of said process water to ultrafiltration treatment, thereby subdividing said process water into a filtrate portion and a concentrate portion, recirculating at least a portion of said concentrate so as to subject it to additional ultrafiltration, thereby raising the concentration of said materials of increased molecular weight, and continuing to expose said dissolved materials in said filtrate to said ultraviolet light and the remainder of said process water to said light until said materials achieve molecular weight sufficient to render said materials separable by ultrafiltration.

4,525,279

DEWATERING OF MINERAL SLURRIES

Ian V. Cooper, Georgetown, Canada, assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 4, 1983, Ser. No. 520,376
Int. Cl.³ C02F *1/56*
U.S. Cl. 210—728 **22 Claims**

17. A process for dewatering an aqueous slurry of a mineral, said process comprising

(I) mixing said aqueous slurry with a dewatering-improving amount of a water-soluble or water-dispersible silicone glycol of general formula

$$(CH_3)_3SiO[(CH_3)_2SiO]_n[CH_3(G)SiO]_mSi(CH_3)_3$$

wherein G is a radical attached to Si through a Si—C bond and of the general formula

$$-D(OC_2H_4)_xOH$$

wherein:

D is an alkylene radical containing from 2 to 4 carbon atoms inclusive and x equals 6–8 inclusive; and wherein n is 0 to 5 inclusive and m is 1 to 5 inclusive; and

(II) thereafter separating the mixture formed in step (I) into an aqueous portion and a mineral portion.

4,525,280

PROCESS FOR SEPARATING A WATER DISPERSION OF ASH, SLAG AND CHAR PARTICULATE MATTER

Stephen R. Vasconcellos, Fishkill; Farrokh Yaghmaie, Wappingers Falls, and Paul E. Howe, Glenham, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,138

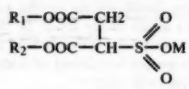
Int. Cl.³ C02F *1/54*

U.S. Cl. 210—728 **16 Claims**

1. A process for separating a water dispersion of particulate solids selected from the group consisting of ash, slag, char and mixtures thereof as produced in the process for the partial oxidation of ash-containing solid carbonaceous fuel comprising:

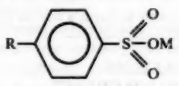
(1) mixing with said water dispersion of particulate solids at a temperature in the range of about 60° to 700° F., and a pressure in the range of about 1 to 250 atmospheres, a salt of an anionic sulfonate surfactant selected from the group consisting of Formula I, Formula II, and mixtures thereof as represented by:

Formula I



wherein R_1 and R_2, which can be the same or different, are selected from the group consisting of a substituted linear or branched alkyl of 6 to 13 carbons, and a substituted cyclic alkyl of 6 to 12 carbons; and M is selected from the group consisting of Na, NH_4, Ca and triethanolamine; and

Formula II



wherein R represents a substituted linear alkyl of 6 to 12 carbons; and M is selected from the group consisting of Na,NH_4, Ca, isopropylamine, and triethanolamine; and a water soluble divalent metal salt consisting of a Group II metal in the Periodic Table Of The Elements in chemical combination with a member selected from the group consisting of halide, nitrate, and mixtures thereof, wherein the molar concentrations of said surfactant and metal salt are each greater than about 2×10^{-4}, and sufficient to decrease the hydrophobicity of the particles whereby the wettability of said particulate solids is increased to aid in their precipitation;

(2) precipitating said particulate solids from the water dispersion in (1); and

(3) separating a clarified stream of water substantially free from said particulate solids.

4,525,281

DEWATERING OF MINERAL SLURRIES

Ian V. Cooper, Georgetown, Canada, assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 4, 1983, Ser. No. 520,369

Int. Cl.³ C02F *1/56*

U.S. Cl. 210—735 **20 Claims**

1. A process for dewatering an aqueous slurry of a mineral, said process comprising

(A) mixing said aqueous slurry with a dewatering-improving amount of an aqueous emulsion consisting essentially of (1) an aminofunctional silicone, of the average formula $(R_2SiO)_x(R'SiO_{3/2})_y$ where R is an alkyl radical containing 1 to 4 carbon atoms, where R′ is a monovalent organic radical containing at least one amino group and where R′ s attached to Si through a Si-C bond, where Y is greater than or equal to 1 and where the sum (x+y) is between 2 and 1000 (2) water, and (3) at least one surfactant and

(B) thereafter separating the mixture formed in step (A) into an aqueous portion and a mineral portion.

4,525,282

METHOD OF LOADING AND/OR TRANSFERRING ENVIRONMENTALLY HARMFUL MATERIALS IN SHALLOW-WATER AND MUDLAND REGIONS AND ARTIFICIAL ISLANDS SUITABLE THEREFOR

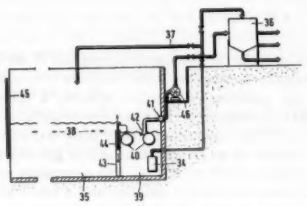
Erich O. Bartsch, Buchholz, and Gerald Vollstedt, Hamburg, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,020

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230927

Int. Cl.³ B01D *17/00, 17/02*

U.S. Cl. 210—747 **10 Claims**



1. An offshore transfer facility for loading and/or transferring environmentally harmful materials, to a marine vessel within a protected environment in shallow water and mud land regions which facility comprises;

an artificial island disposed in an offshore body of water, and comprising an earthen foundation which rests on the floor of said body of water,

means supported by said foundation, forming an enclosure adapted to floatably accommodate the marine vessel, and being encompassed by said aritifical island,

means forming a displaceable barrier to said enclosure which in displaced position allows passage of said marine vessel to and from said means forming an enclosure,

material handling means on said artificial island being adapted to removably communicate with said marine vessel during a material transfer operation;

and meansfor separating environmentally harmful materials from the water confined within the enclosure.

8. Method for transfer of environmentally harmful materials in shallow-water and mudland regions from a marine vessel in an offshore body of water, which method includes the steps of

providing an artificial island at the offshore site, said island including an internal enclosure having an access way to permit passage of the marine vessel between the enclosure and the body of water,

positioning the vessel having environmentally harmful material within the enclsoure,

placing a removable barrier across the said access way to avoid a flow of water therethrough when the marine vessel is positioned therein,

transferring said material between the vessel and the artificial island and,

separating the environmentally harmful material from the water confined within the enclosure,

whereby to avoid contact between said material and the offshore body of water external to said removable barrier.

4,525,283

PROCESS FOR THE DECONTAMINATION OF EFFLUENTS

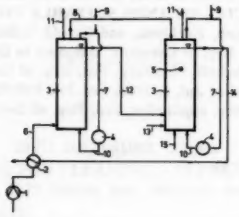
Otto Horak, Cologne; Werner Falkenberg, Leverkusen; Rolf Müders, Cologne, and Werner Beinert, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1983, Ser. No. 516,168

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228625; May 4, 1983, 3316265

Int. Cl.³ C02F *1/72*

U.S. Cl. 210—762 **3 Claims**



1. A process for the decontamination of an effluent loaded with organic substances, which effluent has, where appropriate after the addition of a redox system, a redox potential of 300–600 mv measured at a platinum electrode versus a silver/-silver chloride electrode, comprising oxidizing the effluent with oxygen or an oxygen-containing gas at a pH of 1 to 4, a temperature of 50° to 200° C. and a pressure of 1 to 60 bar in the presence of a redox catalyst and a co-catalyst comprising coal, lignite or peat which has been pretreated with alkali.

4,525,284

METHOD FOR THE CLARIFICATION OF WATER

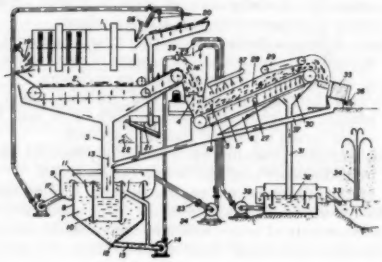
Vaino T. Saalasti, Arinatie 4, SF-00370 Helsinki, Finland

Filed May 12, 1983, Ser. No. 494,100

Claims priority, application Finland, Jul. 21, 1982, 822575

Int. Cl.³ B01D *33/30*

U.S. Cl. 210—777 **7 Claims**



1. In a method for the separation of solid organic materials such as fibers, bark particles or bark sludge from water for the purpose of dewatering and utilizing said organic materials to make fuel, the improvement comprising

providing a first porous conveyor and placing on said porous conveyor a thick, mobile layer consisting of constantly renewable, utilizable organic bark material in coarse particulate form;

filtering water containing said solid organic materials through said thick layer of organic material by passing said water through said layer and extracting clarified water from beneath the porous conveyor; and

removing from the surface of said porous conveyor said constantly renewable, utilizable organic material in coarse particulate form and said solid organic materials which have been filtered from the water, said materials removed from said porous conveyor being suitable for use as fuel.

4,525,285

METHOD OF PREVENTING LOSS OF AN OIL-BASE DRILLING FLUID DURING THE DRILLING OF AN OIL OR GAS WELL INTO A SUBTERRANEAN FORMATION

Adelina J. Son, and Royal E. Loftin, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 31, 1983, Ser. No. 528,326

Int. Cl.³ C09K *7/06*

U.S. Cl. 252—8.5 M **14 Claims**

1. A method of drilling an oil well in a subterranean formation said formation having connate water with monovalent and polyvalent cations comprising:

a. circulating in the well during the drilling of a drilling fluid having a density from about 8.0 to about 25 pounds per U.S. gallon and comprising:

(1) an oil-base liquid said liquid comprising from about 60 to about 99 percent by volume oil and about 1 to about 40 percent by volume water;

(2) a seepage loss reducer present in the range of from about 1 to about 25 pounds per barrel of drilling fluid and comprising a powdered silicate having a molar ratio of silicon dioxide to alkali metal oxide in the range of from about 1.5:1 to about 3.3:1 wherein said alkali metal is selected from the group consisting of sodium, potassium and mixtures thereof; and,

(3) a weighting agent present in an amount sufficient to produce a density of said drilling fluid of from about 8.0 to about 25.0 pounds per U.S. gallon;

(4) an emulsifying agent present in the range of from about 0.1 percent to about 9.0 percent by weight of the weighting agent and the oil-base liquid and selected from the group consisting of a fatty acid, an amide derivative of a fatty acid and mixtures thereof;

whereby said seepage loss reducer reacts with the monovalent and polyvalent cations to form a seal in the formation.

4,525,286

ENHANCED GREASE

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y.

Filed Mar. 6, 1984, Ser. No. 586,820

Int. Cl.³ C10M *5/18*

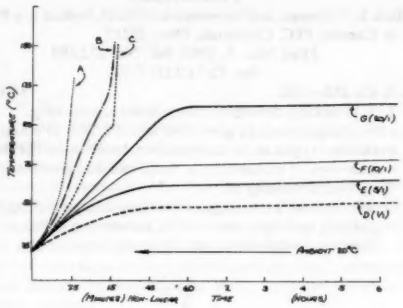
U.S. Cl. 252—21 **11 Claims**

1. An enhanced grease usable with high-speed bearings and in other applications involving severe operating conditions where standard greases give rise to overheating and excessive wear, said enhanced grease comprising:

A. a first major component constituted by a hybrid lubricant concentrate formed by a stabilized suspension of submicronic polytetrafluoroethylene solid particles in a lubricating oil carrier;

B. a second major component intermingled with the first component and constituted by a standard grease composed of a thickening agent dispersed in a lubricating oil, said first and second components being in a ratio which

results in gelling of the first component to produce a semi-solid gel having thixotropic properties and lubricating characteristics measurably superior to that of the standard grease.



4,525,287

THREAD AND BEARING LUBRICANT

Kenneth J. Carstensen, 4540 N. 44th St. No. 70, Phoenix, Ariz. 85018

Filed Jun. 18, 1984, Ser. No. 621,267
Int. Cl.³ C10M *1/54*
U.S. Cl. 252—26 **15 Claims**

1. A lubricant composition for thread and bearing surfaces to be exposed to high temperature and stress loading which comprises about 15 to 50% thickened jojoba oil as a vehicle, about 0.5 to 10% indium, in solid particulate form, metallic and/or semi-metallic lubricating particulates, and about 0.40 to 10% non-metallic particulates.

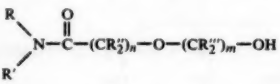
4,525,288

LUBRICANTS CONTAINING HYDROXYALKOXY ACID AMIDES OF ALKYL AMINES AS FRICTION REDUCERS

Raymond C. Schlicht, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,242
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—32.7 E **2 Claims**

1. In a lubricant composition comprising a major amount of an oil of lubricating viscosity and containing an alkenyl succinimide, an overbased calcium sulfonate, a polyethoxylated alkylphenol, a zinc dialkyl dithiophosphate, a diarylamine, a polymethacrylate, an olefin copolymer and a silicon antifoamant, each additive being present in an amount to afford its attendant function, the improvement comprising further including a friction-reducing amount of a hydroxyalkoxyacetamide represented by the formula:



in which R is an alkyl radical having from about 12 to 18 carbon atoms, R′, R″, and R‴ are hydrogen, m is a number from 1 to 10, and n has a value from 1 to 10.

2. A lubricant composition according to claim **1** in which said acetamide is N-oleyl(2′-hydroxy)ethoxy acetamide.

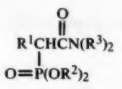
4,525,289

ALPHA-PHOSPHONO LAURAMIDE LUBRICANT ADDITIVES

John K. Howie, Oregonia, and Steven S. Bullock, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

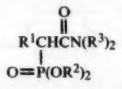
Continuation of Ser. No. 529,899, Sep. 6, 1983, abandoned, which is a continuation of Ser. No. 335,315, Dec. 29, 1981, abandoned. This application Jun. 19, 1984, Ser. No. 622,354
Int. Cl.³ C10M *1/46*
U.S. Cl. 252—49.9 **15 Claims**

1. A compound of the formula



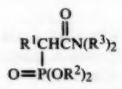
wherein R^1 is a C_{10} hydrocarbyl group; each R^2 is hydrogen or a C_1–C_{12} hydrocarbyl group; each R^3 is hydrogen or a C_1–C_{12} hydrocarbyl group, or the R^3 substituents are joined to form a C_4–C_6 heteroring with the nitrogen atom; provided that the total number of carbon atoms in the R^1, R^2 and R^3 substituents is from about 10 to about 36.

7. A lubricant additive composition comprising from about 10% to about 95% by weight of a lubricant additive carrier material and from about 5% to about 90% by weight of a compound of the formula



wherein R^1 is a C_{10} hydrocarbyl group; each R^2 is hydrogen or a C_1–C_{12} hydrocarbyl group; each R^3 is hydrogen or a C_1–C_{12} hydrocarbyl group, or the R^3 substituents are joined to form a C_4–C_6 heteroring with the nitrogen atom; provided that the total number of carbon atoms in the R^1, R^2 and R^3 substituents is from about 10 to about 36.

8. A lubricant composition comprising a major amount of a base lubricating oil and from about 0.01% to about 2% by weight of a compound of the formula



wherein R^1 is a C_{10} hydrocarbyl group; each R^2 is hydrogen or a C_1–C_{12} hydrocarbyl group; each R^3 is hydrogen or a C_1–C_{12} hydrocarbyl group, or the R^3 substituents are joined to form a C_4–C_6 heteroring with the nitrogen atom; provided that the total number of carbon atoms in the R^1, R^2 and R^3 substituents is from about 10 to about 36.

4,525,290

PROCESS FOR IMPROVING TRACTION COEFFICIENT OF TRACTION DRIVE FLUID AT HIGH TEMPERATURES

Toshiyuki Tsubouchi, Kisarazu, and Hitoshi Hata, Ichihara, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

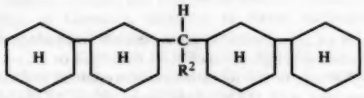
Continuation-in-part of Ser. No. 502,966, Jun. 10, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,311
Claims priority, application Japan, Jun. 24, 1982, 57-107539; Feb. 21, 1983, 58-26325
Int. Cl.³ C07C *13/50*
U.S. Cl. 252—73 **24 Claims**

1. A process for improving the coefficient of traction between at least two relatively rotatable elements in a torque

transmitting relationship and for maintaining said coefficient of traction substantially constant over a broad range of operating temperatures which comprises introducing between the tractive surfaces of said elements a traction drive fluid comprising at least one compound represented by the general formulae (I), (II) and (III):

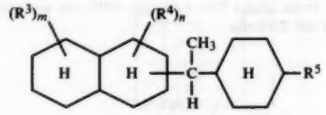
(I)

wherein R^1 is an alkyl group containing from 1 to 3 carbon atoms,



(II)

wherein R^2 is an alkyl group containing 1 or 2 carbon atoms,



(III)

wherein R^3 and R^4 are each a hydrogen or a methyl group, R^5 is a hydrogen or a tert-butyl group, and m and n are each 1 or 2, said compound (III) comprising a mixture of more than 70% of the cis form and less than 30% of the trans form.

4,525,291

LIQUID DETERGENT COMPOSITIONS

Eileen Smith, Chester; Doreen A. Timperley, Widnes, and Dorothy M. Titchener, Chester, all of England, assignors to Interox Chemicals Limited, London, England

Continuation-in-part of Ser. No. 245,141, Mar. 18, 1981, abandoned. This application Feb. 22, 1982, Ser. No. 351,331

Claims priority, application United Kingdom, Apr. 1, 1980, 8010885; Apr. 1, 1980, 8010887; Sep. 30, 1981, 8129512

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ C11D 7/54

U.S. Cl. 252—95 **41 Claims**

1. A stabilised aqueous built alkaline liquid detergent composition comprising at least 4% of an anionic sulphate or sulphonate surfactant and/or of a non-ionic ethoxylate surfactant, at least 5% of a builder selected from alkali metal polyphosphates and carboxylic complexing builders, at least 2% hydrogen peroxide, sufficient alkali metal aryl sulphonate hydrotrope to maintain the composition in a single phase, either by itself or in conjunction with other components, and a stabilising amount of a combination comprising, from 5 to 15% of a low molecular weight mono-hydroxy saturated aliphatic alcohol, from 0.08 to 1% of a polyhydroxy aliphatic carboxylate and from 0.075–1% of an aminomethylene phosphonate or hydroxyalkyl diphosphonate, %'s being by weight, based on the weight of the composition.

4,525,292

BLEACHING DETERGENT COMPOSITIONS COMPRISING SULFOSUCCINATE BLEACH PROMOTERS

Mark E. Cushman, and Lawrence A. Gilbert, both of c/o Procter & Gamble, ITC, Cincinnati, Ohio 45217

Filed Mar. 7, 1983, Ser. No. 472,689

Int. Cl.³ C11D 7/54

U.S. Cl. 252—102 **18 Claims**

1. A bleaching detergent composition comprising:

I. a bleaching system to give from about 0.03% to about 1.3% available oxygen in the composition, based upon the theoretical amount of percarboxylic acid, and being selected from the group consisting of:

(a) a mixture of a peroxygen bleaching compound capable of yielding hydrogen peroxide in an aqueous solution; and a bleach activator having the general formula:

wherein R is an alkyl group containing from about 5 to about 18 carbon atoms wherein the longest linear alkyl chain extending from and including the carbonyl carbon contains from about 6 to about 10 carbon atoms and L is a leaving group, the conjugate acid of which has a pK_a in the range of from about 6 to about 13; or

(b) a percarboxylic acid having the general formula

wherein R has the meaning given hereinbefore or mixtures thereof;

II. from about 1% to about 60% of a detergent surfactant; and

III. at least about ¼% of a water-soluble sulfosuccinate.

4,525,293

COMPOSITION FOR PREVENTING DEPOSITION OF INORGANIC SALTS

Evgeny D. Kisil, bulvar Engelsa, 10, kv. 168; Svetlana N. Komova, ulitsa Odeevskogo, 68a, kv. 61; Olga A. Kulikova, ulitsa imeni Generala Shulimova 16. kv. 47; Leonid I. Kutyanin, ulitsa Zoi Maresevoi, 15, kv. 21; Larisa V. Popova, ulitsa Kirova, 151, kv. 60, all of Volgograd; Nina M. Dyatlova, 2-0i Samotechny pereulok, 4, korpus 1, kv. 4, Moscow; Rostislav P. Lastovsky, ulitsa Gotvalda, 20, kv. 24, Moscow; Galina F. Yaroshenko, ulitsa Udaltsova, 14, kv. 120, Moscow; Rem A. Khramov, B. Khmelnitskogo, 3, kv. 4, Orenburg; Leonid T. Dytjuk, ulitsa Narodnaya, 13, kv. 51, Orenburg; Rafail K. Samakaev, ulitsa Chkalova, 28, kv. 70, Orenburg, and Anatoly N. Vasnev, Borisovsky proezd, 36, korpus 2, kv. 367, Moscow, all of U.S.S.R.

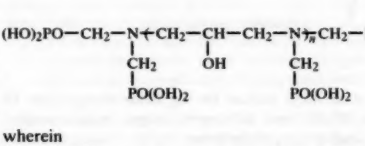
Filed Oct. 3, 1983, Ser. No. 538,561

Int. Cl.³ C02F 5/12, 5/14

U.S. Cl. 252—181 **1 Claim**

1. A composition for preventing deposition of inorganic salts comprising:

a phosphonomethylated derivative of 1,3-diaminopropanol-2 of the general formula:



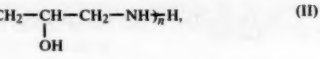
(I)

wherein

n=1 to 20,

amines selected from the group consisting of 1,3-diamino-

propanol-2, a derivative of 1,3-diaminopropanol-2 of the general formula:



(II)

wherein

n=2 to 20,

and a mixture of said amines;

hydrochloric acid;

an alkali metal chloride;

a product of interaction of a chlorinated aromatic compound selected from the group consisting of benzyl chloride, chlorobenzyl chloride, benzylidene chloride and mixtures of said compounds with hexamethylene tetramine, the molar ratio between said chlorinated aromatic compound and hexamethylenetetramine being equal to 1:0.25–0.45 respectively;

a water-soluble organic solvent;

water;

said components being present in the following proportions, percent by weight:

phosphonomethylated derivative of 1,3-diaminopropanol-2 of the general formula (I)	5.0–50.0
amines selected from the group consisting of 1,3-diaminopropanol-2, derivative of 1,3-diaminopropanol-2 of the general formula (II)	5.0–10.0
hydrochloric acid	3.0–30.0
alkali metal chloride	3.0–7.0
product of interaction of a chlorinated aromatic compound with hexamethylene tetramine	0.5–2.5
water-soluble organic solvent	0.5–4.0
water	to 100%.

4,525,294

AMINO ACID MIXTURES, THEIR ALKALI METAL SALTS AND PROCESS FOR PREPARING SAME

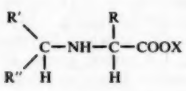
Guido Sartori, Linden, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

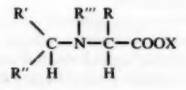
Continuation-in-part of Ser. No. 321,058, Nov. 13, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 484,943 The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ C09K *3/00;* **H05B** *33/00*

U.S. Cl. 252—182 **6 Claims**

1. A composition comprising a mixture of amino acids and alkali metal salts thereof comprising amino acids and salts represented by the formulae:





wherein R is hydrogen or methyl, X is hydrogen or an alkali metal and R′ and R″ are each selected from the group consisting of:

(a) substituted or unsubstituted, linear or branched, alkyl radicals having one to twenty carbon atoms;

(b) substituted or unsubstituted alkylene radicals each having three to six carbon atoms and R′ and R″ together forming a cyclic ring;

(c) substituted or unsubstituted cycloalkyl radicals having from four to eight ring carbon atoms;

(d) substituted or unsubstituted, hydroxy-alkyl radicals, linear or branched, having from one to twenty carbon atoms;

(e) substituted or unsubstituted aralkyl radicals having from seven to twenty carbon atoms, and

wherein R‴ is selected from the group consisting of substituted or unsubstituted linear alkyl radicals having from one to twenty carbon atoms; and wherein the substituent group of (a) thru (e) above, are selected from the group consisting of hydroxyl groups, ether linkages, silane groups, and heterocyclic rings containing oxygen in their rings.

4,525,295

METHOD OF AND COMPOSITION FOR PRODUCING GLOW PRINTING

Jerry D. Lister, Jefferson County, Ky., assignor to Adver-Togs, Inc., New Albany, Ind.

Division of Ser. No. 153,578, May 27, 1980, Pat. No. 4,302,487. This application May 18, 1981, Ser. No. 264,580

Int. Cl.³ B05D *1/32*

U.S. Cl. 252—301.36 **2 Claims**

1. A composition for achieving direct glow printing on a fabric comprising a plastisol base, a solvent thinning said plastisol base, and a solid phosphorescent pigment introduced into air pockets in the mixture of said plastisol base and said solvent.

4,525,296

HALIDE FREE CORROSION INHIBITORS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 27, 1980, Ser. No. 200,817

Int. Cl.³ C23F *11/04*

U.S. Cl. 252—391 **15 Claims**

1. A corrosion inhibiting composition of matter comprising a non-halogen acid salt of a sulfur-nitrogen heterocyclic compound selected from the group consisting of thiazoles, thiazolines, and mixtures thereof, said composition also containing an amount of a surfactant effective to enhance corrosion inhibition.

13. A process of inhibiting corrosion in a system containing stainless steel which comprises treating such system with a composition of matter comprising a non-halogen salt of a sulfur-nitrogen heterocyclic compound selected from the group consisting of thiazoles, thiazolines, and mixtures thereof.

4,525,297

ELECTRO-CONDUCTIVE THERMOPLASTIC RESIN FOAM AND PREPARATION PROCESS THEREOF

Toshihiro Yamane, Otsu; Kenzi Ohashi, Hikone, and Toshiharu Sakaguchi, Ageo, all of Japan, assignors to Toray Industries, Inc. and Tokyo Printing Ink Mfg. Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP83/00109, § 371 Date Nov. 28, 1983, § 102(e) Date Nov. 28, 1983, PCT Pub. No. WO83/03610, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 11, 1983, Ser. No. 557,162

Claims priority, application Japan, Apr. 14, 1982, 57-60908

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **8 Claims**

1. A crosslinked electro-conductive thermoplastic foam consisting of

10 to 90 parts by weight of a crystalline thermoplastic polyolefin resin selected from the group of polyethylene, polypropylene and polypropylene ethylene copolymer,

10 to 90 parts by weight of a low crystalline thermoplastic resin selected from ethylene-vinyl acetate copolymer with the ethylene content of not less than 50 wt % and ethylene-α-

olefin of 3 to 8 carbon atoms copolymer with the ethylene content of not less than 50 wt %, and

5 to 40 parts by weight of electro-conductive carbon per 100 parts by weight of a total of the aforesaid resin components.

4,525,298

ALIPHATIC ALCOHOLS AND ESTERS AND THEIR USE AS PERFUMING INGREDIENTS

Karl H. Schulte-Elte, Onex, and Bernard L. Muller, Geneva, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Nov. 18, 1982, Ser. No. 442,676

Claims priority, application Switzerland, Dec. 7, 1981, 7791/81

Int. Cl.³ C07C *69/24;* C11B *9/00*

U.S. Cl. 252—522 R **3 Claims**

1. 5,7,7-Trimethyloctyl propionate.

3. A perfume composition containing as an active ingredient about 1% to 30% by weight of the compound of claim **1**.

4,525,299

(−)-15-DEOXYSPERGUALIN, PROCESS FOR THE PREPARATION THEREOF, AND INTERMEDIATE OF THE SAME

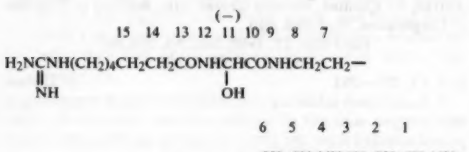
Hamao Umezawa; Tomio Takeuchi, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Filed May 10, 1983, Ser. No. 493,209

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **4 Claims**

1. (−)-15-Deoxyspergualin represented by the following formula



and its non-toxic salts.

4,525,300

HUMAN LEUKEMIA VIRUS-RELATED PEPTIDES, ANTIBODIES OF THE PEPTIDES AND A PROCESS FOR PRODUCTION OF THE ANTIBODIES

Mitsuaki Yoshida; Haruo Sugano, both of Tokyo; Fumio Shimizu, and Kenichi Imagawa, both of Tokushima, all of Japan, assignors to Japanese Foundation for Cancer Research and Otsuka Pharmaceutical Co., Ltd., both of, Japan

Filed Sep. 23, 1983, Ser. No. 535,115

Claims priority, application Japan, Jan. 7, 1983, 58-1495; Feb. 23, 1983, 58-30096

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **13 Claims**

1. A human leukemia virus-related peptide selected from the group consisting of:

(a) a peptide represented by general formula (1):

H-Tyr-Val-Glu-Pro-Thr-Ala-Pro-Gln-Val-Leu-OH (1)

wherein the Tyr moiety may be labelled with radioactive iodine;

(b) a peptide represented by the general formula (2)

R-Ile-Pro-His-Pro-Lys-Asn-Ser-Ile-Gly-Gly-Glu-Val-OH (2)

wherein R is a hydrogen atom or a group represented by the general formula H-Tyr, wherein the Tyr moiety may be labelled with radioactive iodine;

(c) a peptide represented by the general formula (3):

R-Thr-Trp-Thr-Pro-Lys-Asp-Lys-Thr-Lys-Val-Leu-OH (3)

wherein R is a hydrogen atom or a group represented by the general formula H-Tyr, wherein the Tyr moiety may be labelled with radioactive iodine;

(d) a peptide represented by the formula (4):

H-Val-Val-Gln-Pro-Lys-Lys-Pro-Pro-Pro-Tyr-OH (4)

wherein the Tyr moiety may be labelled with radioactive iodine;

(e) a peptide represented by the general formula (5):

R-Met-Gly-Gln-Ile-Phe-Ser-Arg-Ser-Ala-Ser-Pro-OH (5)

wherein R is a hydrogen atom or a group represented by the general formula H-Tyr, wherein the Tyr moiety may be labelled with radioactive iodine;

(f) a peptide represented by the formula (6):

H-Tyr-Pro-Glu-Gly-Thr-Pro-Lys-Asp-Pro-Ile-Leu-Arg-Ser-Leu-Arg-Ser-Leu-OH (6)

wherein the Tyr moiety may be labelled with radioactive iodine.

4,525,301

PROCESS FOR THE PREPARATION OF N-ALKYLATED DIPEPTIDES AND THEIR ESTERS

Rainer Henning, Hattersheim am Main, and Hansjörg Urbach, Kronberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

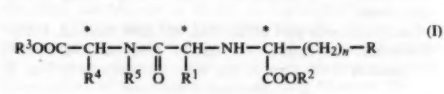
Filed Apr. 26, 1984, Ser. No. 604,220

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315464

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **14 Claims**

1. A process for the preparation of compounds of the formula I



(I)

in which

n is 1 or 2,

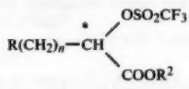
R denotes hydrogen, an aliphatic radical having 1 to 8 carbon atoms, a cycloaliphatic radical having 3–9 carbon atoms, an aromatic radical having 6–12 carbon atoms, an araliphatic radical having 7–14 carbon atoms, a cycloaliphatic-aliphatic radical having 7–14 carbon atoms, or a radical OR^a or SR^a, in which R^a represents an aliphatic radical having 1–4 carbon atoms, an aromatic radical having 6–12 carbon atoms or a heteroaromatic radical having 5–12 ring atoms,

R^1 denotes hydrogen, an aliphatic radical having 1 to 6 carbon atoms, a cycloaliphatic radical having 3–9 carbon atoms, a cycloaliphatic-aliphatic radical having 4–13 carbon atoms, an aromatic radical having 6–12 carbon atoms, an araliphatic radical having 7–16 carbon atoms, a heteroaromatic radical having 5–12 ring atoms, the side-chain of naturally occurring α-aminoacid, or the side-chain of such an amino acid which is protected

R^2 and R^3 are identical or different and denote hydrogen, an aliphatic radical having 1–6 carbon atoms, a cycloaliphatic radical having 3–9 carbon atoms, an aromatic radi-

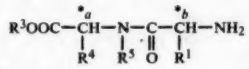
cal having 6–12 carbon atoms, an araliphatic radical having 7–16 carbon atoms, and

R^4 and R^5, together with the atoms carrying them, form a monocyclic, bicyclic or tricyclic heterocyclic ring system having 5 to 15 carbon atoms, which comprises reacting a compound of the formula II



(II)

in which n, R, and R^2 have the abovementioned meanings, with a compound of the formula IV



(IV)

in which R^1, R^3, R^4 and R^5 have the above-mentioned meanings, splitting off.

4,525,302

ACRYLATE AND METHACRYLATE POLYMERS AND PROCESSES FOR PREPARING THEM

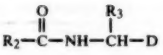
Xuan T. Phan, Manor Township, Lancaster County, and Paul J. Shannon, Millersville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 575,799, Feb. 1, 1984, Pat. No. 4,492,619. This application Jul. 20, 1984, Ser. No. 632,653

Int. Cl.³ C08F *20/36*

U.S. Cl. 260—239.3 R **18 Claims**

1. A process for preparing monomeric materials of the formula

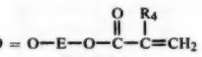


(II)

where

R_2=a lower alkyl group comprising 1–6 carbon atoms, an alkoxy group comprising 1–6 carbon atoms, an aryloxy group, or an alicyclic group,

R_3=H, a lower alkyl group comprising 1–6 carbon atoms, an alicyclic ring, a substituted aromatic ring, an unsubstituted aromatic ring and, where R_3 is other than H, combinations of these moieties,



R_4=H or CH_3, and

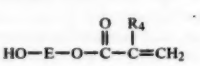
E=an alkylene chain having 2–10 methylene or lower alkyl-substituted methylene groups, or an unsubstituted or alkyl-substituted alkylene ether, diether or triether having a total of 3–14 carbon atoms,

provided that R_2 and R_3 taken together may be an alkylene chain comprising 1–10 carbon atoms, said process comprising the steps of

(1) preparing a solution comprising

(a) an alkoxy compound of Formula II where D=OR_1, R_1=a primary alkyl group comprising 1–3 carbon atoms, and R_2 and R_3 are as described above,

(b) an alcohol of the formula



where E and R_4 are as described above,

(c) an acidic catalyst, and, optionally,

(d) an inert organic solvent, and

(2) interacting said alkoxy compound and said alcohol.

4,525,303

PROCESS FOR PREPARATION OF STEROIDS

Hidetsugu Takagaki, Ichihara; Shigenori Nakanishi, Chiba; Yasuyuki Tanaka, Tokyo; Michihiro Watanabe, Ichihara, and Yoriko Yonehara, Ohmiya, all of Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo, Japan

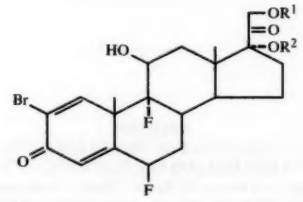
Filed Jun. 17, 1983, Ser. No. 505,292

Claims priority, application Japan, Jun. 21, 1982, 57-105367; Dec. 27, 1982, 57-227076; Dec. 27, 1982, 57-227077

Int. Cl.³ C07J *21/00*

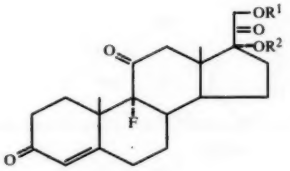
U.S. Cl. 260—239.55 R **14 Claims**

1. A process for preparing a 2-bromo-6β,9α-difluoro-11β,17α,21-trihydroxy-1,4-pregnadien-3,20-dione-17,21-diester (compound 13) represented by the general formula



wherein OR^1 and OR^2 are identical or different, and each represents an acyloxy group or a sulfuric or phosphoric acid ester residue, which comprises

(A) reacting a 17α,21-dihydroxy-9α-fluoro-4-pregnen-3,11,20-trione-17,21-diester (compound 7) represented by the general formula



wherein OR^1 and OR^2 are as defined above, with a ketalizing agent to prepare a 17α,20,21-dihydroxy-3,3-ethylenedioxy-9α-fluoro-5-pregnen-11,20-dione-17,21-diester (compound 8), and

(B) thereafter preparing the compound 13 by

(i) reducing the compound 8 to form a 11β-hydroxy compound (compound 9), reacting the hydroxy compound with a peracid to form a 5α,6α-epoxy compound (compound 10), reacting the epoxy compound with hydrogen fluoride to form a 6β-fluoro-5α-hydroxy-3-keto compound (compound 11), brominating the keto compound to form a 2,2-dibromo compound (compound 12), and dehydrobrominating and then dehydrating the dibromo compound to form the compound 13 , or

(ii) treating the compound 8 with a peracid to form a 5α,6α-epoxy compound (compound 14), reducing the epoxy compound to form a 11β-hydroxy compound (compound 10), reacting the hydroxy compound with hydrogen fluoride to form a 6β-fluoro-5α-hydroxy-3-keto compound (compound 11), brominating the keto compound to form a 2,2-dibromo compound (compound 12), and dehydrobrominating and then dehydrating the dibromo compound to form the compound 13 , or

(iii) treating the compound 8 with a peracid to form a

5α,6α-epoxy compound (compound 14), reacting the epoxy compound with hydrogen fluoride to form a 6β-fluoro-5α-hydroxy-3-keto compound (compound 15), brominating the keto compound to form a 2,2-dibromo compound (compound 16), dehydrobrominating and then dehydrating the dibromo compound to form a 1,4-diene compound (compound 17), and reducing the diene compound to form the compound 13 .

2. The process of claim 1 wherein the 17α,21-dihydroxy-9α-fluoro-4-pregnen-3,11,20-trione-17,21-diester (compound 7) used as a starting material is prepared by reacting a 17α,21-dihydroxy-4,9(11)-pregnadien-3,20-dione-17,21-diester with hypochlorous acid or hydrobromous acid to form a halohydrin compound (compound 4), reacting the halohydrin with a basic substance to form a 9β,11β-epoxy compound (compound 5), reacting the epoxy compound with hydrogen fluoride to form a 9α-fluoro-11β-hydroxy compound (compound 6), and oxidizing the hydroxy compound to convert it to a 11-keto compound.

4,525,304

PROCESS FOR PREPARING OXAZOLINOAZETIDINONES

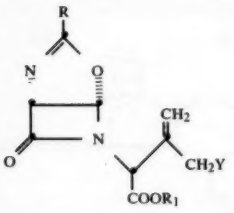
David A. Hall, and Wayne A. Spitzer, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 16, 1982, Ser. No. 442,052

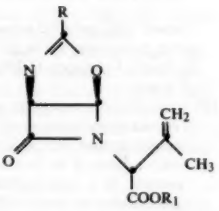
Int. Cl.[3] **C07D** *498/04, 205/08*

U.S. Cl. 260—245.4 **16 Claims**

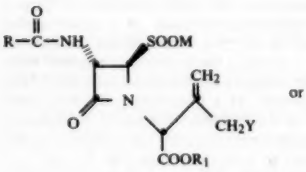
1. A process for preparing compounds of the formula



and



in which Y is hydrogen or hydroxyl, which comprises reacting a sulfinic acid of the formula



or

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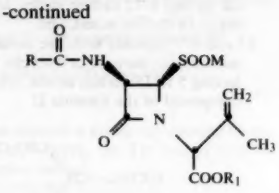


with an oxidizing agent selected from the group consisting of a Pb^{+4} compound, an Mn^{+4} compound; sodium hypochlorite, an N-haloimide, and ammonium cerium nitrate; in which, in the above formulae,

M is hydrogen, lithium, potassium, sodium, ammonium, or substituted ammonium;

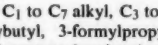
R_1 is hydrogen, lithium, potassium, sodium, ammonium, substituted ammonium, or a carboxylic acid protecting group; and

R is

(a) C_1 to C_7 alkyl, C_3 to C_7 alkenyl, halomethyl, 4-carboxybutyl, 3-formylpropyl, 4-protected carboxybutyl, or 4-protected amino-4-protected carboxybutyl;

(b) a group R_2 in which R_2 is 1,4-cyclohexadienyl, phenyl or phenyl substituted on its ring by 1 or 2 groups selected from the group consisting of chloro, bromo, hydroxy, proteced hydroxy, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl, and protected aminomethyl;

(c) a group of the formula

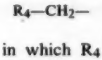


in which R_2 is as defined above and m is zero or one;

(d) a group of the formula

in which R_3 is R_2 as defined above, 2-thienyl, or 3-thienyl; and W is hydroxy, protected hydroxy, carboxy, protected carboxy, amino, or protected amino; or

(e) a group of the formula



in which R_4 is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, or 1-tetrazolyl.

4,525,305

LEATHER WITH FLUOROCHEMICAL FINISH

Kalyanji U. Patel, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1982, Ser. No. 436,267

Int. Cl.[3] **C11C** *3/00;* **C14C** *9/00, 9/02;* **D06M** *13/40*

U.S. Cl. 260—401 **10 Claims**

1. Compositions useful for imparting oil and water repellency to fibrous substrates when said substrates are contacted with said compositions, said compositions comprising fluorochemical compounds which are normally solid, water insoluble, aliphatic carboxylic acids and salts thereof which are self-dispersible in water, said compounds containing fluoroaliphatic and aliphatic carboxylic radicals, said fluoroaliphatic radicals having at least three fully fluorinated carbon atoms and a terminal perfluoromethyl group, and urylene and/or carbamato radicals, said radicals bonded together by organic linkages free of interfering moieties, said compounds containing at least 20 weight percent fluorine in the form of said fluoroaliphatic radical.

4,525,306

METHOD FOR PREVENTION OF OXIDATION OF OILS AND FATS AND SOFT CAPSULES CONTAINING THE TREATED OILS AND FATS

Mizuo Yajima, Tokyo, Japan, assignor to Asama Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,747

Claims priority, application Japan, Sep. 21, 1981, 56-147822; Oct. 20, 1981, 56-166363

Int. Cl.[3] C11B 5/00

U.S. Cl. 260—428.5 8 Claims

1. A soft gelatin capsule filled with an edible fish oil containing eicosapentaneoic acid and docosahexaenoic acid, said edible fish oil containing admixed therewith from 0.01 to 10 percent by weight of an antioxidant component, based on the weight of said oil, said antioxidant component having been obtained by extracting (A) a starting material selected from the group consisting of herb spices, residues obtained after collecting essential oils from herb spices, oleoresins obtained by extracting herb spices with a polar solvent, oleoresins obtained by extracting herb spices with a non-polar solvent and residues remaining after extraction of herb spices, with (B) a polar solvent whereby to obtain an extract, then steam distilling the extract and then recovering the insoluble part from the residue of the steam distillation, as said antioxidant component.

4,525,307

MODIFIED ALUMINUM TRI-ALKOXIDE COMPOUNDS

Charles E. Pratt, Bethlehem, Pa., assignor to Joseph Ayers, Inc., Bethlehem, Pa.

Filed Aug. 2, 1983, Ser. No. 519,560

Int. Cl.[3] C07F 5/06

U.S. Cl. 556—182 12 Claims

1. A modified aluminum tri-isopropoxide compound wherein about 0.125 to about 0.50 mole of isopropoxide, per atom of aluminum, is replaced with a C_6- to C_{18}- alkoxide.

4,525,308

HYDROXY-T-ALKYL PEROXYESTERS

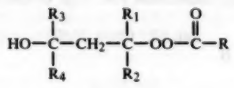
Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 20, 1983, Ser. No. 496,357

Int. Cl.[3] C07C 179/18

U.S. Cl. 260—453 RZ 3 Claims

1. A hydroxy-t-alkyl peroxyester of the structure

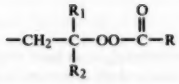


having a ten hour half-life temperature below about 75° C., where

R_1 and R_2 are selected from an alkyl of 1 to 4 carbons,

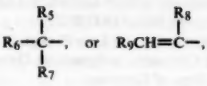
R_3 and R_4 are selected from hydrogen of an alkyl of 1 to 4 carbons,

R_1 and R_3 can be connected together to form a lower alkyl substituted 3 carbon atom alkylene bridge and R_3 can additionally be



and

R is selected from



where

R_5 is selected from hydrogen or an alkyl of 1 to 8 carbons,

R_6 is selected from alkyl of 1 to 8 carbons,

R_7 is selected from the group consisting of an alkyl of 1 to 8 carbons, an alkenyl of 1 to 8 carbons, a hydrocarbyl aryl of 6 to 10 carbons, an alkoxy of 1 to 6 carbons and a hydrocarbyl aryloxy of 6 to 10 carbons, and

R_8 and R_9 are selected from an alkyl of 1 to 4 carbons.

4,525,309

LEWIS ACID CATALYSIS OF THE HOMOLOGATION OF BORONIC ESTERS WITH HALOALKYLMETAL REAGENTS

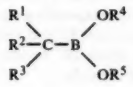
Donald S. Matteson, Moscow, Id., and Kizhakethil M. Sadhu, Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Mar. 15, 1983, Ser. No. 475,531

Int. Cl.[3] C07F 5/04

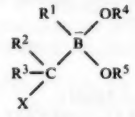
U.S. Cl. 260—462 C 27 Claims

1. In a process for preparing boronate esters having the general structure



II

from boronate complexes having the general structure,



I

where each of R^1, R^4 and R^5, independently, is an organic group selected from the group consisting of aliphatic, aromatic and functionally substituted aliphatic and aromatic groups, where X is a nucleofugic group, where R^2 is a nucleofugic group or an organic group selected from the group consisting of aliphatic, aromatic and functionally substituted aliphatic or aromatic groups, R^3 is hydrogen or a group selected from the same groups as R^2, and where R^4 and R^5 may be the same or different and may be linked such that the resulting $OR^4—R^4O$ boronic ester group is cyclic, the improvement which comprises contacting the boronate complex (I) in solution in the temperature range −40° to +80° C. with a Lewis acid catalyst, having an acid strength which is sufficiently high to combine with the nucleofugic group X to form a complex, but which is low enough so as not to destory the groups OR^4, OR^5 and $OR^4—R^5O$, said catalyst having an acid strength on the order of that characteristic of ferric chloride, ferric bromide, zinc chloride and zinc bromide.

4,525,310
METHOD OF PREPARING 3-ALKOXY ACRYLONITRILES

Christoph Theis, Bornheim, and Uwe Prange, Niederkassel, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

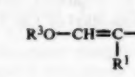
Filed Feb. 16, 1983, Ser. No. 467,053

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206878

Int. Cl.³ C07C *121/453*

U.S. Cl. 260—465.6 **8 Claims**

1. A method of preparing 3-alkoxy-acrylonitriles of the formula



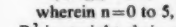
I

wherein

R^1 is H; straight-chain or branched alkyl moieties of 1 to 20 carbon atoms; straight-chain or branched moieties $-(CH_2)_n-CN$, $-(CH_2)_nOR^4$ or $-(CH_2)_n-CH(OR^4)_2$ wherein n=0 to 5, and R^4 is alkyl; and

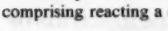
R^3 is straight-chain or branched alkyl or alkenyl moieties with 1 to 12 carbon atoms, the moieties $-(CH_2)_p-OR^4$ with p=1 to 5 and R^4 with the above meaning;

comprising reacting a compound of the formula



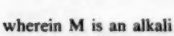
II,

which serves as both starting material and solvent wherein R^1 has the above meaning, with an alcoholate of the formula



III,

wherein M is an alkali metal with m=1 or an alkaline earth metal with m=2 and R^2 is a straight-chain or branched alkyl moiety of 1 to 5 carbon atoms, and with carbon monoxide at elevated pressure of at least about 5 bar and a temperature of 20° to 220° C. to form the corresponding alpha-formyl alkali or alkaline earth salt of compound II; and reacting the resulting salt at a temperature of about 20° to about 220° C. with a halogen compound of the formula



IV,

wherein R^3 has the above-given meaning and Hal represents chlorine, bromine or iodine.

4,525,311
O,O-DIALKYL-N-(BENZYL OR T-BUTYL)-N-CYANOMETHYL AMINOMETHYLPHOSPHONATES

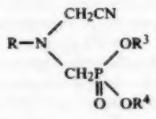
Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 391,023, Jun. 22, 1982,. This application Nov. 21, 1983, Ser. No. 553,452

Int. Cl.³ C07F *9/40*

U.S. Cl. 260—940 **3 Claims**

1. A compound of the formula



wherein R is tert-butyl or benzyl, R_3 is C_1–C_6 alkyl and R^2 is C_1–C_6 alkyl.

4,525,312
OPTICAL FIBRE REINSTATEMENT

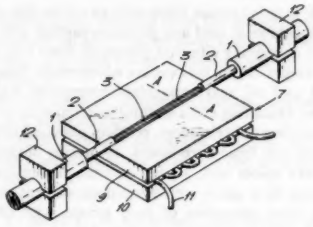
Stephen R. Jones, St. Mary Bourne, England, assignor to Standard Telephones and Cables plc, London, England

Filed Nov. 23, 1983, Ser. No. 554,805

Claims priority, application United Kingdom, Nov. 24, 1982, 8233469

Int. Cl.³ B29D *11/00*; C03C *25/02*

U.S. Cl. 264—1.5 **4 Claims**



1. A method of providing reinstatement primary and secondary coatings on a length of uncoated optical fibre, said length extending between two portions of the optical fibre having existing primary and secondary coatings, the method including the steps of arranging the length of optical fibre in a groove of a single element open mould, the groove being shaped to enable the length of optical fibre to be lifted from the mould after application to said length of said reinstatement primary coating; placing a quantity of uncured liquid primary coating material in the groove such that the length of uncoated optical fibre is immersed in the primary coating material; curing the primary coating material to form said reinstatement primary coating; removing the length of optical fibre from the mould; and injection moulding the reinstatement secondary coating over the reinstatement primary coating such that the reinstatement secondary coating extends between the existing secondary coatings of said two portions.

4,525,313
PROCESS AND APPARATUS FOR PRODUCING SINGLE- OR MULTI-BASE PROPELLANTS

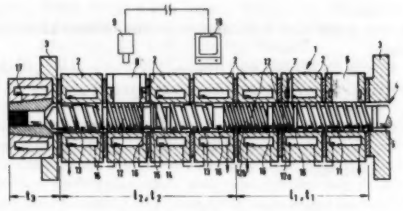
Dietmar Müller, Karlsruhe, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,356

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242301

Int. Cl.³ C06B *21/00*

U.S. Cl. 264—3 B **15 Claims**



1. A process for producing an at least single-base propellant in rod form using a twin shaft screw extruder with an intake zone for starting components of said propellant, at least one of said components being moistened with alcohol, with a mixing and kneading zone downstream from and next to said intake

zone in which solvent is run into said components for plastifying same and with an outlet zone downstream from said kneading and mixing zone, said outlet zone being next to screw means of said extruder and having a molding head for forming said components as processed in said extruder into at least one rod, said intake zone being kept at a raised temperature, and said kneading and mixing zone and said outlet zone being kept at a generally constant temperature that is greater than the temperature of the inlet zone.

4,525,314

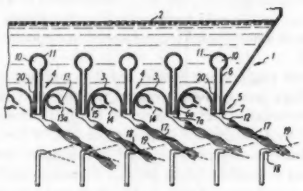
PRODUCING METAL AND METAL GLASS MICROFILAMENTS

Leonard B. Torobin, 120 Interstate North, Suite 158, Atlanta, Ga. 30339

Continuation-in-part of Ser. No. 245,137, Mar. 18, 1981, Pat. No. 4,415,512, and Ser. No. 325,594, Nov. 27, 1981, Pat. No. 4,363,646, which is a continuation-in-part of Ser. No. 152,693, May 23, 1980, Pat. No. 4,303,431, which is a continuation of Ser. No. 59,297, Jul. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 937,123, Aug. 28, 1978, abandoned, and Ser. No. 944,643, Sep. 21, 1978, abandoned. This application Nov. 8, 1982, Ser. No. 439,894

Int. Cl.³ C03B *19/10*

U.S. Cl. 264—9 **18 Claims**



1. A method for making metal microfilaments which comprises heating film forming metal material to form molten film forming metal material, forming a liquid film of molten metal material across an orifice, applying a blowing gas at a positive pressure on the inner surface of the liquid metal material film to blow the metal material film and form an elongated hollow metal material tube or cylinder, forming a thinned wall or weakened portion of the elongated hollow metal material tube or cylinder, subjecting the elongated hollow tube or cylinder during its formation to a pulsating or fluctuating pressure field having periodic oscillations, said pulsating or fluctuating pressure field acting on said elongated hollow tube or cylinder to assist in its formation and to assist in the formation of a multiplicity of metal material microfilaments and in detaching the metal microfilaments from said orifice.

4,525,315

METHOD OF CORRECTING IRREGULARITIES IN THE BUILT-UP OF A MAT DURING THE MANUFACTURE OF PARTICLEBOARD

Ernst Greten, Alfeld, Fed. Rep. of Germany, assignor to GreCon Greten GmbH & Co. KG, Alfeld, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,970

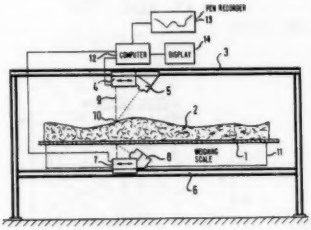
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148800

Int. Cl.³ B29J *5/00*; G01N *9/00, 21/86*

U.S. Cl. 264—40.4 **13 Claims**

1. A method of determining and correcting, during manufacture of particleboard, fluctuations in the weight per unit area of loose mat material scatttered by a scattering machine having at least one setting onto a mat carrier, said mat material having an upper surface and a composition comprising particulate material and at least one binder, the method comprising the steps of:

(a) taking a plurality of individual distance measurements in the form of contactless measurements at various measurement positions across the mat material as the mat material moves on said mat carrier through a measurement station, by measuring the distance between a single predetermined measurement plane and the upper surface of the mat at each of said measurement positions, said contactless distance measurement being taken with a laser, said laser being focussed relative to the mat surface in such a way that the size of a scanning light bead of the laser lies at



least within the range of the smallest occurring surface irregularities of the mat,

(b) processing the individual measurements obtained as values representative of the weight per unit area of the mat at the respective measurement positions, and

(c) controlling at least one setting of the scattering machine and the material composition in order to compensate for deviations from a desired value of the weight per unit area of the mat at the respective measurement positions.

4,525,316

SHIPPING FLEXIBLE POLYURETHANE FOAM PRODUCT

Edward A. Galla, Whitehall, and Bruce A. Smoyer, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 15, 1984, Ser. No. 580,317

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—54 **20 Claims**

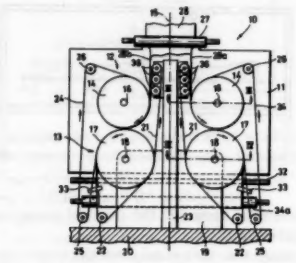
1. In a method for shipping flexible polyurethane foam product comprising (a) reacting a flexible polyurethane foam composition containing a polyisocyanate, a polyether polyol, a surfactant, a catalyst system and water to provide a foam product, (b) conditioning the foam product by storing for a time and at a temperature sufficient to develop substantially full cure, (c) applying a force to compress the product to reduce its size, (d) shipping the compressed product and (e) removing the compression force so that the product may return to its original size, the improvement for reducing the conditioning time or temperature to develop substantially full cure prior to compressing the foam product while ensuring the substantial restitution of the foam product when the compression force is removed which improvement comprises employing in the flexible polyurethane foam composition a polyurethane amine catalyst system in which the major portion is N-(C_1–C_{18}) hydrocarbyl morpholine or N-[di(C_1–C_4)alkylamino (C_2–C_4)alkyl] morpholine.

4,525,317

METHOD AND APPARATUS FOR STRETCHING FILM OR FIBROUS WEB

Tokio Okada; Haruhisa Tani; Shigezo Kojima; Kazuhiko Kurihara, all of Tokyo, and Hirosi Yazawa, Kunitachi, all of Japan, assignors to Nippon Petrochemicals, Co., Ltd., Chiyoda and Polymer Processing Research Institute Ltd., Toyko, both of, Japan

Filed Jun. 10, 1983, Ser. No. 502,976
Claims priority, application Japan, Jun. 15, 1982, 57-102750
Int. Cl.[3] B29C *17/02*
U.S. Cl. 264—235.8 14 Claims



1. A method of stretching a thermoplastic polymer film or fibrous web, comprising the steps of:

(a) feeding the film or fibrous web longitudinally at a first speed;

(b) stretching the film or fibrous web by

(I) gripping the same along at least two laterally spaced first longitudinal portions between (1) the peripheries of at least two radially disposed first pulleys of substantially the same dimensions rotating at a peripheral second speed in opposite directions and (2) first endless belt means equal in number to the first pulleys, respectively trained around and running with the first pulleys, the first pulleys and the first endless belt means forming at least two first arcuate divergent paths, and moving the gripped first longitudinal portions respectively along the first arcuate divergent paths substantially over a quarter of the full circumference of the pulleys, and then

(II) gripping the once-stretched film or fibrous web along at least two laterally spaced second longitudinal portions adjacent to said first longitudinal portions between (1) the peripheries of second pulleys of substantially the same dimensions, the second pulleys being equal in number to the first pulleys and respectively disposed downstream of and close to the first pulleys in coplanar relation thereto and rotating at a peripheral third speed in directions opposite to those of the respective first pulleys, and (2) second endless belt means equal in number to the second pulleys, respectively trained around and running with the second pulleys, the first and second belt means extending in two adjacent parallel planes, respectively, the second pulleys and the second endless belt means forming at least two second arcuate divergent paths contiguous to said first arcuate divergent paths, respectively, and moving the gripped second longitudinal portions respectively along said second arcuate divergent paths, the movement of the film along said first arcuate divergent paths and said second arcuate divergent paths being in only one direction throughout the stretching of the film wherein the film or fibrous web is in flattened tubular form, and the tubular film or fibrous web is supported at said first longitudinal portions from inside on respective portions of said first endless belt means disposed within the tubular film or fibrous web in abutment against said first longitudinal portions while it is longitudinally fed, is stretched by first being gripped along said first longitudinal portions between said portions of the first endless belt means and the peripheries of the first pulleys disposed outside the tubular film or fibrous web, and by being moved along said first arcuate divergent paths, and second by being gripped along said second longitudinal portions between respective portions of said second endless belt means disposed outside the tubular film or fibrous web and the peripheries of the second pulleys disposed within the tubular film or fibrous web, and by being moved along said second arcuate divergent paths, and after being stretched, is cut along said second longitudinal portions into a plurality of sheets at a portion adjacent to that where the tubular film or fibrous web is released from said second endless belt means and pulleys at the ends of said second arcuate divergent paths;

(c) conditioning the film or fibrous web to a state suitable for stretching during the stretching thereof; and

(d) withdrawing the twice-stretched film or fibrous web longitudinally at a fourth speed.

8. An apparatus for stretching a thermoplastic polymer film or fibrous web, comprising:

(a) means for feeding the film or fibrous web at a first speed along a longitudinal path;

(b) a first gripping means including

(I) at least two first pulleys of substantially the same dimensions disposed radially with respect to a central line along which said longitudinal path extends and rotatable at a peripheral second speed in opposite directions, and

(II) first endless belt means equal in number to said first pulleys, respectively trained around said first pulleys substantially over a quarter of the full circumference of said first pulleys for gripping the film or fibrous web at at least two laterally spaced first longitudinal portions along at least two first arcuate divergent paths between the peripheries of said first pulleys and said first endless belt means, whereby the film or fibrous web is stretched upon rotation of said first pulleys;

(c) a second gripping means including

(I) second pulleys of substantially the same dimensions, the second pulleys being equal in number to said first pulleys and respectively disposed downstream of and close to said first pulleys in coplanar relation thereto and rotatable at a peripheral third speed in directions opposite to those of the respective first pulleys;

(II) second endless belt means equal in number to the second pulleys, respectively trained around said second pulleys substantially over a quarter of their full circumferences for gripping the film or fibrous web at two laterally spaced second longitudinal portions adjacent to said first longitudinal portions along at least two second arcuate divergent paths between the peripheries of said second pulleys and said second endless belt means, said second arcuate divergent paths being contiguous to said first arcuate divergent paths, whereby the film or fibrous web is further stretched upon rotation of said second pulleys and whereby said film or web is stretched while moving only in one direction wherein said first endless belt means are also trained around said second pulleys along said second arcuate divergent paths, said second endless belt means are also trained around said first pulleys along said first arcuate divergent paths, each of said first and second pulleys includes at least two pulley members rotatable independently with respect to one another, each said first endless belt means is trained around one of said pulley members of each of said first and second pulleys, and each said second endless belt means is trained around the other pulley member of each of said first and second pulleys in parallel relation to said first endless belt means,

(d) means for conditioning the film or fibrous web to a state suitable for stretching during the stretching thereof; and

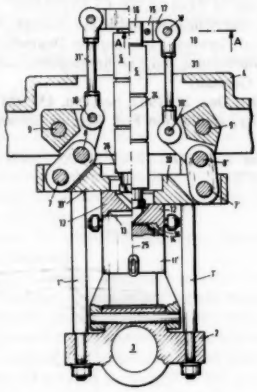
(e) means for withdrawing the stretched film or fibrous web.

4,525,318

APPARATUS FOR MOULDING A PLASTICS COMPONENT ONTO A LENGTH OF FLEXIBLE WEB MATERIAL AND METHOD FOR SAME

Wilhelm Reil, Bensheim; Ulrich Deutschbein, Mühltal, and Manfred Wallich, Nauheim, all of Fed. Rep. of Germany, assignors to Tetra Pak Developpement S.A., Pully, Switzerland

Filed Feb. 17, 1983, Ser. No. 467,448
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207701
Int. Cl.³ B29F *1/022;* B29C *5/00;* B29D *31/00*
U.S. Cl. 264—259 11 Claims



1. A method for moulding plastic components onto a length of flexible material which comprises:

(a) placing a length of flexible material onto a mandrel;

(b) positioning the mandrel into a moulding position by rotating a wheel to which the mandrel is attached;

(c) moving external mould portions together about the mandrel covered with said material;

(d) moving a head plate carrying an injection moulding nozzle into positive and frictional engagement with the external mould portions to hold them together such that said mandrel, said external mould portions and said head plate define a mould cavity for the plastic component;

(e) injecting plastic material into the cavity through said nozzle;

(f) moving said head plate and said external mould portions away from said mandrel;

(g) moving said mandrel, covered with said length of material having a moulded plastic component on the material, away from said moulding position by again rotating said wheel;

(h) positioning another mandrel covered with another length of tube material into said moulding position by rotating said wheel to which said other mandrel is attached; and

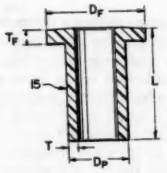
(i) repeating steps c through g with respect to said other material and said other mandrel.

4,525,319

METHOD AND APPARATUS FOR FORMING A SINGLE FLANGE PIPE ADAPTER

Paul E. Kaspe, Ardrossan, Canada, assignor to Prolite Plastics Limited, Edmonton, Canada

Filed Oct. 6, 1983, Ser. No. 539,679
Claims priority, application Canada, Apr. 27, 1983, 426835
Int. Cl.³ B29C *1/00*
U.S. Cl. 264—322 18 Claims



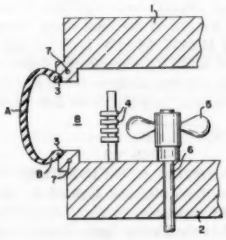
1. A process for manufacturing a single flare flange adapter from a length of suitable thermoplastic resin tube which process comprises the steps of, heating an end portion of the tube to soften it; arranging said tube in a sleeve member with the heated tube end projecting therefrom; inserting a flanged male plug member into the heated end of said tube and relatively moving said sleeve member and said plug member longitudinally towards each other under pressure to cause said flanged plug member to flare the heated end of the tube outwardly through an obtuse angle against a limiting means to form a single flange on the said tube; cooling the formed flanged tube; removing the flanged tube from said members; and stress relieving the flanged tube.

4,525,320

METHOD OF PREHEATING AND PREFORMING A GREEN TIRE

Kazumasa Sarumaru, 8-27 Kinmitsu-cho, Ashiya 659, Japan

Filed Feb. 21, 1984, Ser. No. 581,692
Claims priority, application Japan, May 30, 1983, 58-95519
Int. Cl.³ B29H *5/02, 17/26*
U.S. Cl. 264—502 6 Claims



1. A method of preheating and preforming a green tire before final vulcanization, utilizing a pair of generally circular axially movable discs, said method comprising the steps of supporting the tire beads between said pair of discs to form a tightly closed interior space, moving said discs toward each other and thereby axially compressing the tire until the tire has a shape substantially the same as the final tire shape, supplying said interior space with a thermal medium, heating said medium and said tire to a preheat temperature which is substantially lower than the temperature at which the final vulcanization starts, and removing said tire from said discs while at said preheat temperature.

4,525,321
PROCESS FOR PREPARING FLAT ARTICLES BASED ON DEFIBRATED COMPONENTS OF WOOD

Heinz Tönniges, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Fibrit Gesellschaft Ebers & Dr. Müller mbH, Krefeld, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,788

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208963

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—517 **17 Claims**

1. In a process for manufacturing a three-dimensional article by compression-moulding under dry conditions into any desired shape where the walls are thin relative their area and which are based on defibrated wood fibres to which binders have been added and which have a moisture content of 1 to 30% by weight relative to all components of an article, the improvement wherein a proportioned amount of the moulding material disposed in an air stream is brought in contact with the bottom side of a preform sieve and a vacuum is applied from above said sieve whereby to form a fibre containing preform, and the thus preformed product is then compression-moulded into the desired final shape of the article.

4,525,322
ETHYLENE POLYMER COMPOSITION FOR BLOW MOLDING

Matthew A. Page; William J. Libbey, and Allan J. Lundeen, all of Ponca City, Okla., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1983, Ser. No. 508,696

Int. Cl.³ C08L *23/06*

U.S. Cl. 264—531 **7 Claims**

1. Intermittent blow-molding processes using polyethylene resins prepared via Ziegler/Natta catalysts comprising high molecular weight, medium molecular weight and low molecular weight fractions, wherein

(A) The viscosity average molecular weight of high molecular weight component (H-MW) ranges from 590,000 to about 860,000 and comprises from 12 to about 25 percent by weight of the total resin;

(B) The viscosity average molecular weight of the medium molecular weight component (M-MW) is from about 75,000 to about 600,000 and comprises from about 5 to about 83% by weight of the total resin;

(C) The viscosity average molecular weight of the low molecular weight component (L-MW) is from about 10,000 to about 100,000 and comprises from about 5 to about 83% by weight of the total resin; wherein

(D) The ratio of H-MW/M-MW is $\geqq 1.7$ and the ratio of M-MW/L-MW is $\geqq 1.7$, wherein the density of the total resin is from about 0.940 to about 0.970 and the melt index at 2.16 kilogram load is from about 0.01 to about 2.0.

4,525,323
ION BEAM INERTIAL CONFINEMENT TARGET

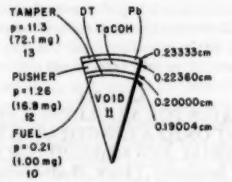
Roger O. Bangerter, Danville, and Donald J. Meeker, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 4, 1977, Ser. No. 821,940

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—106 **3 Claims**

1. In a system comprising means for extracting useful energy in a controlled manner from a target imploded by energy from at least one ion beam, said target having a centrally located quantity of fusion fuel which gives off useful energy in a controlled manner when imploded by ion beam energy, the improvement consisting of: a pusher consisting of TaCOH positioned substantially contiguously about said fuel, said pusher inhibiting energy transport into said fuel and preventing preheat of said fuel, said pusher while containing relatively little mass and because of a small density difference between said fuel and said pusher functioning to decrease fluid instabilities caused by pusher-fuel mixing during final stages of implosion of the fuel; and a tamper surrounding and substantially contiguous about said pusher, said tamper consisting of Pb, said



pusher of TaCOH includes about 1 atomic percent of tantalum, said tamper and said tantalum of said pusher having a combined total density times radial thickness (ρr) of less than 1 gm/cm^2.

4,525,324
DRY STORAGE FACILITY FOR IRRADIATED NUCLEAR REACTOR FUEL ELEMENTS

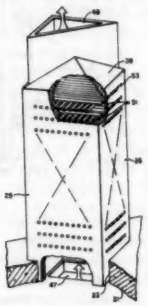
Harry Spilker, Bad Muender, and Klaus Einfeld, Murnau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,938

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151310

Int. Cl.³ G21C *19/40, 19/06, 19/08*

U.S. Cl. 376—272 **9 Claims**



1. Dry storage facility for storing radioactive materials such as irradiated nuclear reactor fuel elements releasing heat produced by radioactive decay, the radioactive materials being held in gas-tight, elongated storage containers defining respective longitudinal axes, the dry storage facility comprising:

an enclosure;

a plurality of upwardly extending storage modules disposed in said enclosure for accommodating said elongated storage containers;

said elongated storage containers being grouped into a plurality of sets of containers;

each of said storage modules including first holding means for holding a first portion of said sets of containers in respective ones of a first group of horizontal planes arranged one atop the other;

said storage module including second holding means for holding the remaining portion of said sets in respective ones of a second group of horizontal planes interlayered in interdigital fashion with said first group of horizontal planes;

said fist holding means and said second holding means being arranged in said module so as to cause the longitudinal axes of the containers in one plane to be disposed so that the respective longitudinal axes thereof are disposed crosswise with respect to the longitudinal axes of the containers in the next adjacent plane;

the longitudinal axes of the containers in every other one of said first group of horizontal planes being horizontally displaced from the respective longitudinal axis of the containers in the next adjacent horizontal plane of said first group;

the containers in every other one of said second group of horizontal planes being laterally displaced from the containers in the next adjacent horizontal plane of said second group; and,

convection cooling means for conducting cooling air through said storage modules to cool said containers.

4,525,325

COPPER-NICKEL-TIN-COBALT SPINODAL ALLOY

Ronald J. Livak, Wallingford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,516
Int. Cl.³ C22C *9/02*
U.S. Cl. 420—473 **35 Claims**

1. A copper base spinodal alloy consisting essentially of from about 5 to about 30 percent by weight nickel, from about 4 to about 13 percent by weight tin, from about 3.5 to about 7 percent by weight cobalt and the balance copper, with the sum of the nickel and cobalt contents being no more than 35 percent by weight of the alloy.

16. A process for preparing a copper base spinodal alloy body which comprises:

(a) providing a copper base alloy powder containing from about 5 to about 30 percent by weight nickel, from about 4 to about 13 percent by weight tin, from about 3.5 to about 7 percent by weight cobalt, and the balance copper, with the sum of the nickel and cobalt contents being no more than 35 percent by weight of the powder;

(b) compacting the alloy powder to form a green body having structural integrity and sufficient porosity to be penetrated by a reducing atmosphere;

(c) sintering the green body in the reducing atmosphere to form a metallurgical bond; and

(d) cooling the sintered body at a rate such that age hardening and embrittlement are prevented.

4,525,326

ALUMINUM ALLOY

Pius Schwellinger, Lottstetten, Fed. Rep. of Germany; Alois Ried, Schaffhausen, Switzerland; Jürgen Timm, Steisslingen, and Manfred Heckler, Singen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 18, 1983, Ser. No. 524,412
Claims priority, application Switzerland, Sep. 13, 1982, 5413/82
Int. Cl.³ C22C *21/02*
U.S. Cl. 420—535 **12 Claims**

1. Heat-treatable aluminum base alloy consisting essentially of 0.3–1.0% magnesium, 0.3–1.2% silicon, 0.1–0.5% iron, up to 0.4% copper, 0.05–0.20% vanadium, a manganese content equal to ⅓ to ⅔ of the concentration of iron, and the balance essentially aluminum.

4,525,327

LEAD-ANTIMONY-MAGNESIUM ALLOYS FOR STORAGE CELL SUPPORTS AND METHOD OF MANUFACTURING SAID ALLOYS

Roland Bardin, Villeurbanne; Joël Mack, Lamure sur Azergues, and Jean-Jacques Counioux, Villeurbanne, all of France, assignors to Compagnie Europeenne d'Accumulateurs, Paris, France

PCT No. PCT/FR82/00106, § 371 Date Dec. 28, 1982, § 102(e) Date Dec. 28, 1982, PCT Pub. No. WO83/00261, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 24, 1982, Ser. No. 456,041
Claims priority, application France, Jun. 26, 1981, 81 12603
Int. Cl.³ C22C *11/10, 1/03*
U.S. Cl. 420—565 **9 Claims**

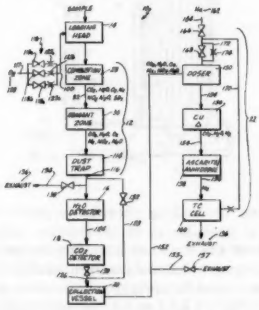
1. In a lead-acid storage cell, an electrode support comprising a lead based alloy consisting essentially of between 0.05% and 4% antimony, between 0.02% and 0.3% magnesium, between 0% and 0.3% tin, between 0% and 5% arsenic, between 0% and 0.075% copper, between 0% and 0.006% sulfur, and the balance of said alloy being lead, further characterized in that said alloy contains no barium.

4,525,328

CARBON, HYDROGEN, AND NITROGEN ANALYZER

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,214
Int. Cl.³ G01N *1/22, 31/10, 31/12*
U.S. Cl. 422—80 **7 Claims**



1. A system for analyzing the elemental content of a sample comprising:

furnace means for combusting a sample into constituent gases;

reservoir means for collecting and equilibrating the constituent gases;

first conduit and valve means actuable for conveying the constituent gases from said furnace means to said reservoir means during combustion of the sample;

second conduit and valve means actuable for conveying the constituent gases from said reservoir means for analysis, said first and second conduit means including a common conduit portion through which the constituent gases pass when conveyed to said reservoir means from said furnace means during combustion of the sample and when conveyed from the reservoir means during analysis;

a detector operably connected to said common conduit portion providing a signal responsive to the amount of at least one of the constituent gases within said common conduit portion; and

control means operably connected to said first and second valve means and to said detector for controlling said first and second valve means and thereby controlling gas flow through said common conduit portion, said control means

including means for opening said first conduit and valve means during combustion of the sample in said furnace means permitting the constituent gases to flow through said common conduit portion to said reservoir means until said signal falls below a minimum value indicating that sample combustion is essentially complete, said control means further including means for opening said second conduit and valve means after the gases are equilibrated within said reservoir means permitting the equilibrated constituent gases to flow through said common conduit portion whereupon said signal is indicative of the amount of the one constituent gas within the equilibrated constituent gases.

4,525,329

PROCESS AND APPARATUS FOR MAKING PHOSPHORUS PENTOXIDE WITH UTILIZATION OF REACTION HEAT

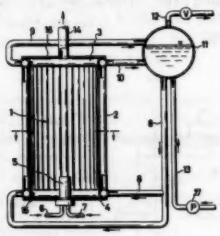
Bernhard Kuxdorf, Brühl; Peter Luhr, Bad Münstereifel; Hugo Werner, Hürth; Ursus Thümmler, Erftstadt, and Friedrich-Wilhelm Dorn, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 601,027

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315630

Int. Cl.³ C01B *25/12*

U.S. Cl. 422—202 **21 Claims**



1. An apparatus for making phosphorus pentoxide by subjecting elemental phosphorus to combustion with dried air with utilization of the reaction heat for the production of energy, comprising: a cylindrical combustion chamber made of stainless steel, arranged in upright position and presenting a height/diameter-ratio of 2.5:1 to 5:1; said combustion chamber being gastightly closed at its upper end by means of a circular covering plate and at its lower end by means of a circular base plate, and having its walls arranged so as to form a cooling system with cavities therein; said cavities being connected to a circular upper collecting tube and to a circular lower collecting tube, respectively, arranged in horizontal position; a steam separating means being connected by a conduit system to said upper collecting tube and to said lower collecting tube, respectively; said steam separating means being provided with an upper hot steam outlet and being penetrated by a lower fresh water feed pipe; said covering plate being provided with a phosphorus pentoxide outlet; and said base plate being penetrated by one burner centrally disposed in said base plate, said burner being provided with a phosphorus feed line and a dried air feed line, respectively.

11. An apparatus for making phosphorus pentoxide by subjecting elemental phosphorus to combustion with dried air with utilization of the reaction heat for the production of energy, comprising: a cylindrical combustion chamber made of stainless steel, arranged in upright position and presenting a height/diameter-ratio of 2.5:1 to 5:1; said combustion chamber being gastightly closed at its upper end by means of a circular covering plate and at its lower end by means of a circular base plate, and having its walls arranged so as to form a cooling system with cavities therein; said cavities being connected to a circular upper collecting tube and to a circular lower collecting tube, respectively, arranged in horizontal position; a steam separating means being connected by a conduit system to said upper collecting tube and to said lower collecting tube, respectively; said steam separating means being provided with an upper hot steam outlet and being penetrated by a lower fresh water feed pipe; said covering plate being provided with a phosphorus pentoxide outlet; and said base plate being penetrated by 2 to 10 burners disposed axisymmetrically in said base plate, said burners being provided with a phosphorus feed line and a dried air feed line, respectively.

4,525,330

PROCESS FOR THE EXTRACTION OF METAL VALUES AND NOVEL METAL EXTRACTANTS

Raymond F. Dalton, Cheshire; Raymond Price, Huddersfield; Peter M. Quan, Lancashire, and David Stewart, Oldham, all of England, assignors to Imperial Chemical Industries Limited, London, England

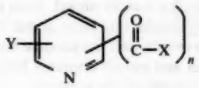
Continuation-in-part of Ser. No. 341,176, Jan. 20, 1982, abandoned. This application Sep. 16, 1982, Ser. No. 418,833

Claims priority, application United Kingdom, Feb. 3, 1981, 8103223; Aug. 26, 1981, 8126079

Int. Cl.³ B01D *11/04*; C01G *3/00*

U.S. Cl. 423—24 **19 Claims**

1. In a solvent extraction process for extracting copper values from aqueous solutions of copper salts containing halide or pseudo halide anion which comprises the steps of (1) contacting the aqueous solution containing copper salts with a solution of an extractant in a water-immiscible organic solvent to extract the copper into the solvent in the form of a complex of copper and the extractant; (2) separating the aqueous solution from the solution of the complex in the water-immiscible solvent; and (3) contacting the resultant organic phase with an aqueous strip solution whereby the complex of copper with the extractant is unstable and copper transfers into the aqueous strip solution, the improvement in which the extractant is a substituted pyridine of the formula:



wherein X is the group $-OR_1$, R_1 being a hydrocarbyl group containing from 5 to 36 carbon atoms, and n is 1, 2 or 3; and wherein Y is hydrogen or is one or more substituents selected from the group consisting of halogen, alkyl, aryl, alkoxy, aryloxy, aralkyl, cyano, nitro and carboxylic acid.

4,525,331

PROCESS FOR PURIFYING MOLYBDENUM TRIOXIDE

Michael J. Cheresnowsky; Timothy A. Brunelli, both of Towanda; Robin W. Munn, Sayre, and Tai K. Kim, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

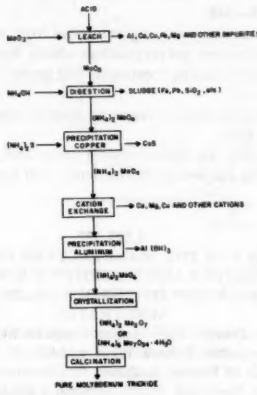
Filed Feb. 24, 1984, Ser. No. 584,843

Int. Cl.³ C01G *39/00*

U.S. Cl. 423—54 **8 Claims**

1. A method for preparing ammonium molybdate having low impurities aluminum, calcium, copper, magnesium, and iron from an impure concentrate of molybdenum trioxide comprising contacting said concentrate with an aqueous solution comprising about 4.2 moles per liter of nitric acid, and about 1.75 moles per liter of ammonium nitrate to solubilize less than about 1.5 percent of the molybdenum values from said concentrate and solubilize a major portion of said impurities, wherein during contacting from about 0.85 parts to less than about one part by weight aqueous solution is present per part of impure concentrate, washing the resulting concentrate, digesting said resulting concentrate with an aqueous solution

of ammonium hydroxide at suitable concentrations to solubilize substantially all of the molybdenum values present in said resulting concentrate as ammonium molybdate and form an ammonium molybdate solution, adding ammonium sulfide to said ammonium molybdate solution in an amount sufficient to convert substantially all of the soluble copper values present in said solution to an insoluble copper sulfide, separating said ammonium molybdate solution from an insoluble residue, and contacting said resulting ammonium molybdate solution with a



chelate cation exchange resin in ammonium form, removing ammonia to adjust the pH of said ammonium molybdate solution of from about 6 to about 8 to convert substantially all of the soluble aluminum values to an insoluble aluminum hydroxide, separating said resulting ammonium molybdate solution from a resulting insoluble residue, and concentrating said resulting ammonium molybdate to form ammonium molybdate having low impurities, aluminum, calcium, copper, magensium, and iron.

4,525,332

RECOVERY OF GERMANIUM FROM AQUEOUS SOLUTIONS

Daniel A. D. Boateng, Montrose; Donald L. Ball, Castlegar, and Godefridus M. Swinkels, Rossland, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Mar. 20, 1984, Ser. No. 591,525

Claims priority, application Canada, Feb. 2, 1984, 446656

Int. Cl.³ C01G *17/00*

U.S. Cl. 423—89 **25 Claims**

1. A process for the recovery of germanium from aqueous solutions containing germanium, zinc and antimony, which process comprises:

(i) germanium sorption from the aqueous solution by contacting the solution with an ion exchange resin which has as its matrix a backbone polymer to which are attached amino active groups chosen from secondary and tertiary amines and quaternary ammonium groups, which resin also exhibits a selectivity ratio of germanium relative to antimony of at least 50:1; and

(ii) elution of the sorbed germanium from the ion exchange resin with an aqueous medium to provide an aqueous solution containing the major part of the germanium sorbed by the resin, and a resin containing a minor part of the sorbed germanium.

4,525,333

PROCESS FOR SEPARATING GALLIUM AND INDIUM FROM AQUEOUS SOLUTIONS

Günther Schimmel; Gero Heymer, both of Erftstadt; Werner Kraüse, Hürth, and Werner Pieper, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 531,156

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235136

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **10 Claims**

1. In the process for separating gallium and indium from an aqueous solution by subjecting the solution to liquid/liquid extraction with the use of an organylphosphonic acid ester as extraction solvent and separating the resulting liquid phases from one another, the improvement which comprises: using as the extraction solvent either

(a) a mixture consisting essentially of a compound of general formula I

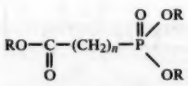
I

and up to 90% of a compound of general formula II

II

or

(b) a compound of formula III


III

or

a mixture consisting essentially of a compound of formula III with a said mixture of compounds of formulae I and II, in which R stands for an identical or different unsubstituted alkyl, cycloalkyl or aryl group having from 2 to 20 carbon atoms and n stands for a whole number within the range 0 to 4.

4,525,334

PROCESS FOR THE PRODUCTION OF SILICON

Peter Woditsch; Martin Abels, and Berthold Brazel, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,204

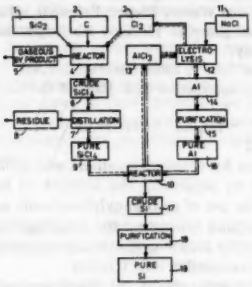
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310828

Int. Cl.³ C01B *33/00*

U.S. Cl. 423—324 **5 Claims**

1. A process for the production of silicon comprising reacting a gaseous silicon compound of the formula SiH_nX_{4-n}, wherein X is selected from the group consisting of fluorine,

chlorine, bromine and iodine and n is 0 to 3, with aluminum in a reactor at an elevated temperature at which by product



AlX_3 is in vapor state so that the reactor at all times contains only gases and solids.

4,525,335

METHOD OF MANUFACTURING CRYSTALLINE SILICON NITRIDE AND METHOD OF SEPARATION THEREOF

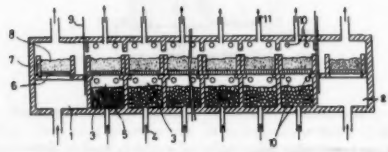
Minoru Tanaka, Kobe, and Tadashi Kawabe, Ako, both of Japan, assignors to Tateho Kagaku Kogyo Kabushiki Kaisha, Ako, Japan

Filed Mar. 17, 1983, Ser. No. 476,200

Claims priority, application Japan, Apr. 1, 1982, 57-55196

Int. Cl.³ C01B *21/068;* B03B *5/30*

U.S. Cl. 423—344 **10 Claims**



1. A method of manufacturing silicon nitride comprising the following steps:

(a) providing a silicon and carbon containing material having both a thin cross section and sufficient porosity to permit the passage of a gas therethrough;

(b) arranging said material on a gas-permeable, heat-resistant support;

(c) placing the material-bearing support in an air tight furnace, said furnace adapted to provide a plurality of temperature zones from a low of about 400 degrees C. through a high in the range 1,350 degrees C. through 1,450 degrees C.;

(d) horizontally moving said material-bearing support successively through each of said temperature zones, in the direction of increasing temperature;

(e) passing a non-oxidizing gas through the heated material, said gas being nitrogen in zones of the furnace wherein the temperature is in excess of about 1,300 degrees C.; and

(f) removing silicon-nitride whisker-containing material from said furnace.

9. A method of separating a collection of silicon nitride comprising dispersing materials having generated and grown silicon nitride on the internal and external surfaces thereof into a mixture of a hydrophobic organic liquid, water, and hydrochloric acid, and after keeping it at rest, separately isolating said whiskers in the water phase and the rest of the material in the organic liquid phase.

4,525,336

PROCESS FOR REMOVING IMPURITIES FROM SILICON FRAGMENTS

Rudolf Griesshammer, Altötting, and Michael Peterat, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,529

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332447

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—348 **9 Claims**

1. A process for removing impurities from silicon fragments which result when polycrystalline silicon formed bodies are subjected to a crushing treatment, said process comprising the steps of:

(a) treating the silicon fragments with an aqueous solution of nitrate salts;

(b) annealing the so-treated fragments; and,

(c) treating the annealed fragments with hydrofluoric acid.

4,525,337

PROCESS FOR THE MANUFACTURE OF COMPACT COMPOSITE CARBONACEOUS MATERIALS BY DENSIFICATION OF POROUS CARBONACEOUS SUBSTRATES

Jean Jamet, Janvry; Jean-Jacques Poupeau, St-Remy-les-Chevreuse; Jacqueline Omnes, Paris, and Claude Le Pennec, Vincennes, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Office National d'Etudes et de Recherche Aerospatiales, Chatilcon, both of, France

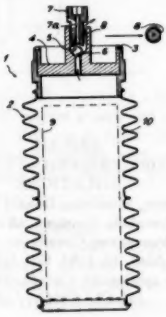
Continuation-in-part of Ser. No. 244,877, Mar. 18, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 477,487

Claims priority, application France, Mar. 28, 1980, 80 07034; Sep. 18, 1980, 80 20089

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.³ C01B *31/04, 31/02*

U.S. Cl. 423—449 **3 Claims**



1. A process for the accelerated densification of a porous carbonaceous substrate comprising decomposing a hydrocarbon substance having a free carbon content of about 30% in the presence of said substrate under high pressure at a high temperature, wherein said decomposition is effected in a liquid phase within a closed reactor and results in the production of hydrogen, and wherein the reactor in which said densification occurs has walls which have a flexibility sufficient to ensure that the internal volume of said reactor adapts, under the effect of the applied pressure, to the volume of the liquid phase contained therein, and wherein said porous carbonaceous substrate has a thickness exceeding 20 mm, and is formed by the multidirectional weaving of continuous carbon fibers which are oriented according to at least three principal direction of space.

4,525,338

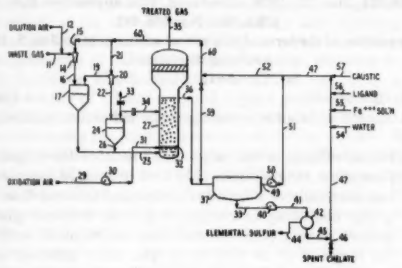
METHOD FOR REMOVAL OF HYDROGEN SULFIDE

Howard W. Klee, Jr., Naperville, Ill., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 462,679, Jan. 31, 1983,. This application Jun. 7, 1984, Ser. No. 618,456

Int. Cl.[3] B01D *53/34*; C01B *17/04*

U.S. Cl. 423—573 G 7 Claims



1. A continuous process for recovering sulfur values from a hydrogen sulfide-containing gaseous stream which comprises the steps of

(a) contacting said hydrogen sulfide-containing gaseous stream with an aqueous solution of a water-soluble oxidized polyvalent metal chelate catalyst at alkaline pH thereby converting the hydrogen sulfide to particulate elemental sulfur and reducing the polyvalent metal chelate catalyst and forming a suspension of particulate elemental sulfur in said aqueous solution and a first product gas stream depleted in hydrogen sulfide,

(b) contacting said suspension with free oxygen-containing gas in an oxidation zone under flotation conditions thereby oxidizing the polyvalent metal chelate to its oxidized form and forming a regenerated aqueous solution and introducing into the same oxidation zone into contact with the regenerated aqueous solution said first product gas stream thereby converting remaining hydrogen sulfide in said first product gas stream to elemental sulfur and forming a second product gas stream doubly depleted in hydrogen sulfide and an aqueous liquid phase containing the oxidized polyvalent metal chelate catalyst and a sulfur particle-gas-liquid foam phase,

(c) separating the foam phase from the aqueous liquid phase,

(d) recycling at least a portion of the aqueous liquid phase to the contacting step of (a), and

(e) recovering elemental sulfur from the foam phase.

4,525,339

ENTERIC COATED ORAL DOSAGE FORM

Charanjit Behl, Bloomfield; George Beskid, Upper Montclair; Navnit Shah, Clifton; Jacques Tossounian, Pine Brook, and Joel Unowsky, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 15, 1982, Ser. No. 434,452

Int. Cl.[3] A61K *9/62, 9/36, 31/43*

U.S. Cl. 424—16 15 Claims

1. An orally administered enteric coated pharmaceutical composition which consists essentially of from about 50 to 500 mg of beta-lactam antibiotic distributed in at least about 33% by weight of an enhancer consisting of a C_2 to C_{12} glyceride mixture of at least one glyceride selected from the group consisting essentially of monoglycerides, diglycerides and triglycerids of fatty acids of C_2 to C_{12} chain length and mixtures thereof and adjuvants suitable for oral enteric administration.

4,525,340

COMPOSITE BODY FOR LONG-TERM DELIVERY OF EFFECTIVE SUBSTANCES

Wolfgang Lange, Obernburg, Fed. Rep. of Germany, and G. J. Boer, Muidenberg, Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed Apr. 20, 1983, Ser. No. 486,846

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214667

Int. Cl.[3] A61J *3/00*; A61K *9/00*

U.S. Cl. 424—16 13 Claims

1. A composite body for long-term delivery of effective substances, comprising a carrier for effective substance and composed of a microporous thermoplastic polymer with pores containing effective substances; and a coating composed of cellulose nitrate in contact with said microporous polymer.

4,525,341

METHOD OF ADMINISTERING VITAMINS

Joseph A. Deihl, Phoenix, Ariz., assignor to Mayor Pharmaceutical Laboratories, Inc., Tempe, Ariz.

Filed Apr. 9, 1984, Ser. No. 598,480

Int. Cl.[3] A61K *9/00, 31/59, 31/365, 31/07*

U.S. Cl. 424—43 1 Claim

1. A method for autogenously administering vitamins to a human subject concurrently with the use of an aerosol breath spray, comprising the steps of:

(a) forming a sprayable liquid composition comprising

(i) a breath freshening agent,

(ii) at least one vitamin in a diet supplemental amount selected from the class consisting of vitamins A, B, C, D, E, G, H, K and P, and

(iii) a non-toxic liquid carrier for said breath freshening agent and said vitamin; and

(b) spraying an effective amount of an aerosol of said composition into the mouth of said subject.

4,525,342

DENTAL AND ORAL PREPARATION

Ervin Weiss, 18 Kley St., Tel Aviv; Melvin Rosenberg, 12 Yedaam St., Ramat-gan, and Herbert Judas, 5 Habrosh St., Raanana, all of Israel

Filed Feb. 21, 1984, Ser. No. 582,065

Claims priority, application Israel, Mar. 3, 1983, 68027

Int. Cl.[3] A61J *7/00, 7/16*

U.S. Cl. 424—49 5 Claims

1. A mouthwash for dental and oral hygiene, adapted to desorb microorganisms and absorb odorous mercapto compounds causing halitosis, which mouthwash comprises a system of two physically separate liquid phases, provided in a double compartment doublesquirt bottle adapted to be emulsified by swishing in the mouth, one of said phases being a solution of sodium chloride in water as an aqueous phase, and the other an oily phase which is a vegetable oil, a mineral oil or a hydrocarbon, said aqueous phase and said oily phase being in the ratio between 2:1 and 1:1 by volume.

4,525,343

TOOTH AND MOUTH CARE AGENT

Helmut Raaf, Bockenau, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 597,849

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314895

Int. Cl.[3] A61K *7/16, 7/22*

U.S. Cl. 424—54 1 Claim

1. Tooth and mouth care preparations in the form of toothpaste, mouthwash, mouth spray or tooth powder containing a mixture of 0.05 to 2.5% by weight of hesperidin and 5 to 15% by weight of urea which is an essential active ingredient effective to treat and prevent gingival bleeding.

4,525,344

SKIN CARE AND SHAVING COMPOSITION

Ronald J. Tutsky, P.O. Box 1646, Greenwich, Conn. 06836

Filed Aug. 15, 1983, Ser. No. 523,003
Int. Cl.³ A61K 7/15; B26D 7/08
U.S. Cl. 424—73 12 Claims

1. A substantially waterless shaving composition which is also effective in conditioning skin which comprises about 5–20% by weight of total composition of phospholipid; about 0.5–5% by weight of total composition of vitamin E; about 2–15% by weight of total composition of wheat germ oil and the remainder being a mixture of seed and vegetable oils.

4,525,345

CONSTANT ORDER RELEASE, SOLID DOSAGE INDOMETHACIN FORMULATION AND METHOD OF TREATING ARTHRITIS AND OTHER INFLAMMATORY CONDITIONS

James M. Dunn, Littleton, and Ronald T. Haas, Highland Ranch, both of Colo., assignors to Verex Laboratories, Inc., Englewood, Colo.

Continuation of Ser. No. 334,124, Dec. 24, 1981, abandoned. This application Aug. 6, 1984, Ser. No. 637,843
Int. Cl.³ A61K 9/22, 9/30, 9/52, 9/56
U.S. Cl. 424—22 25 Claims

1. A constant release rate indomethacin formulation in tablet unit dosage form, said tablet comprising an intimate screened, solvent wet-granulated admixture of from 50 to 200 mg of indomethacin, from about 1.7 to 3.7 weight percent of a slow-dissolving water-insoluble cellulose derivative selected from the group consisting of cellulose acetate phthalate and ethyl cellulose, dissolved in the wet-granulation solvent, the wet granulation being completely dried before screening, from about 1.5 to 5.0 weight percent of a tabletting disintegrant, and from about 40 to 80 weight percent of a pharmaceutically acceptable bulking agent or diluent.

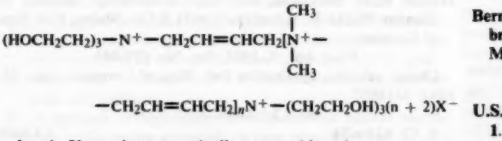
4,525,346

AQUEOUS ANTIMICROBIAL OPHTHALMIC SOLUTIONS

Raymond L. Stark, Midland, Mich., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 509,281, Jun. 29, 1983, abandoned, which is a continuation of Ser. No. 306,317, Sep. 28, 1981, Pat. No. 4,407,791. This application Sep. 29, 1983, Ser. No. 537,331
Int. Cl.³ A61K 31/74, 31/79, 31/14
U.S. Cl. 424—80 25 Claims

1. An aqueous ophthalmic contact lens solution comprising: from about 0.00001 to about 3.0 percent by weight/volume of a quaternary ammonium compound having a number average molecular weight in the range of about 2,000 to about 30,000, said compound having the formula



$$(HOCH_2CH_2)_3-N^+-CH_2CH=CHCH_2[N^+-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{}}-CH_2CH=CHCH_2]_nN^+-(CH_2CH_2OH)_3(n+2)X^-$$

wherein X=a pharmaceutically acceptable anion;

an effective amount of NaCl to provide isotonicity to said solution; and

an effective amount of buffer to provide said solution with an ophthalmically acceptable pH.

4,525,347

ANTIINFLAMMATORY ANALGESIC GELLED OINTMENT

Toshio Inagi, Hachioji; Toyojiro Muramatsu, Sayama, and Hidetaka Nagai, Hachioji, all of Japan, assignors to Kowa Company Limited, Nagoya, Japan

Continuation-in-part of Ser. No. 304,909, Sep. 23, 1981, abandoned, which is a continuation of Ser. No. 87,574, Oct. 23, 1979, Pat. No. 4,309,414, which is a continuation of Ser. No. 918,021, Jun. 22, 1978, abandoned. This application Feb. 22, 1983, Ser. No. 468,491
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.³ A61K 31/40, 31/78
U.S. Cl. 424—81 2 Claims

1. An anti-inflammatory analgesic gelled ointment, comprising:

(a) indomethacin in the range of 0.5 to 1.5% by weight;

(b) a medium ranging from 15 to 85% by weight and consisting essentially of a hydroxy compound selected from the group consisting of propylene glycol, butylene glycol, polyethylene glycol, ethanol, and isopropanol, water in the range of 30 to 55% by weight, and a gelating agent ranging from 0.5 to 5% by weight of a carboxyvinyl polymer which has been neutralized with aqueous ammonia;

(c) an adjuvant being present in the range of 0.5 to 5% by weight and selected from the group consisting of a C_1–C_5 alcohol ester of a C_4–C_{14} monocarboxylic acid and a C_1–C_3 alcohol diester of a C_4–C_{10} dicarboxylic acid; and

(d) water in an amount sufficient to make up the balance of said ointment, said ointment being adjusted in its pH of 4.8 to 7.5.

4,525,348

PRANOPROFEN GELLED OINTMENT

Kenzo Arizono; Michio Terasawa, and Michiharu Nobutoki, all of Oita, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Japan

Filed Dec. 19, 1983, Ser. No. 562,570
Int. Cl.³ A61K 31/78
U.S. Cl. 424—81 6 Claims

1. An antiinflammatory and analgesic gelled ointment containing 0.5–5% by weight of pranoprofen, 10–90% by weight of at least one member selected from the group consisting of a mono-, bi- or tri-hydric lower aliphatic alcohol, polyethylene glycol having an average molecular weight in the range of 200–1000, methyl ethyl ketone and acetone, 0.1–5% by weight of a gelling agent selected from the group consisting of carboxyvinyl polymer, hydroxyethyl cellulose, alginic acid and carboxymethyl cellulose, an adequate amount of a water-soluble basic substance selected from the group consisting of ammonia, sodium hydroxide, potassium hydroxide, triethanolamine, diethanolamine, diisopropanolamine, triisopropanolamine and triethylamine, and 10–90% by weight of water.

4,525,349

PROCESS FOR THE LARGE-SCALE PRODUCTION OF A VACCINE AGAINST POLIOMYELITIS AND THE RESULTING VACCINE

Bernard J. Montagnon, and Bernard J. C. Fanget, both of L'Arbresle, France, assignors to Societe Anonyme dite: Institut Merueux, Lyons, France

Filed Dec. 29, 1981, Ser. No. 335,352
Int. Cl.³ A61K 39/13
U.S. Cl. 424—89 9 Claims

1. Process for the large-scale production of poliomyelitis vaccine separately entailing, for each type of poliomyelitis virus used, stages consisting in multiplying a VERO cell strain beginning with a cell stock by means of culturing on microcarriers in suspension in a liquid nutritive medium, said microcarriers being balls with an average diameter of about 50 to 300

microns in the dry state and with a density very slightly greater than 1, made of dextran polymers and bearing on their surfaces grafted radicals of di-ethyl-amino-ethyl, with the concentration of microcarriers in terms of weight being between 1 and 5 grams per liter of said liquid medium, by successive passages into increasing volumes of biogenerators, each passage being carried out for six to eight days, the last passage being carried out in a biogenerator whose tank holds at least 150 liters, said liquid nutritive medium containing serum, while stirring at a rate not greater than 40 r.p.m., drawing off the liquid nutritive medium at the end of the final passage and replacing it by another liquid medium containing no serum, inoculating the biogenerator of the last passage with virus, allowing the virus to develop at a temperatue between 35° C. and 37° C., a pH in the vicinity of 7.4 and a partial oxygen pressure in the vicinity of 10 percent, while stirring at a rate not greater than 40 r.p.m., withdrawing the liquid suspension after virus culture, filtering the suspension drawn off, concentrating the filtered suspension at least 150 times by means of ultrafiltration, carrying out a gel filtration of the concentrated suspension, subjecting the suspension obtained to ion exchange chromatography, diluting the concentrated suspension obtained with a serum free medium, inactivating the suspension thus diluted and purified, then mixing the suspensions of the respective types used and preparing the individual dosages.

4,525,350

METHODS OF STIMULATING HOST DEFENSE SYSTEM WITH COENZYMES Q_4 TO Q_{13}

Adria C. Casey, Ridgefield; Alan D. Adler, West Redding, both of Conn., and Eugene T. Premuzic, Montauk, N.Y., assignors to The New England Institute, Inc., Ridgefield, Conn.

Continuation of Ser. No. 551,430, Feb. 20, 1975, which is a continuation of Ser. No. 343,487, Mar. 21, 1973, abandoned, which is a continuation of Ser. No. 95,026, Dec. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 757,862, Sep. 6, 1968, abandoned. This application Nov. 13, 1978, Ser. No. 960,026

Int. Cl.[3] **A61K** *37/48, 31/12*

U.S. Cl. 424—94 **11 Claims**

1. The method of enhancing a body's resistance to disease which comprises stimulating the host defense system of the body by administering an effective amount of a compound selected from substantially pure coenzymes Q_4 to Q_{13} or mixtures thereof.

4,525,351

LIQUID ADHERENT DISINFECTANT COMPOSITIONS FOR TOPICAL APPLICATION AND METHOD OF PREPARATION

Sybil H. Gehrman, and Randolph S. Porubcan, both of West Allis, Wis., assignors to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

Filed Jan. 11, 1983, Ser. No. 457,212

Int. Cl.[3] **A01N** *63/02;* **C12P** *7/56*

U.S. Cl. 424—95 **12 Claims**

1. A method of preparing a liquid adherent disinfectant mixture, comprising:

(a) preparing a fermentable culture medium from water and nonfat dry milk solids (NFDM), said medium containing from 6 to 16% by weight of NFDM and from 1.5 to 4.0% casein;

(b) inoculating the culture medium with a lactic acid producing fermentation culture;

(c) fermenting said inoculated medium with the production of lactic acid at least until the casein precipitates as a coagulum; and

(d) thereafter mechanically disintegrating the casein coagulum in the medium to form fine particles thereof, and dissolving in said medium from 1.8 to 3.4 parts by weight of active detergent per part of disintegrated casein, said detergent being selected from the class consisting of the sodium; potassium and ammonium aliphatic sulfate detergents and mixtures thereof wherein the aliphatic groups contain from 10 to 16 carbons, said disintegrated casein being mixed with said detergent and being effective to disperse and solubilize said disintegrated casein, whereby said final mixture is in a sticky adherent condition.

7. The method of claim 1 in which said culture comprises strains selected from the class of Lactobacilli consisting of *Lactobacillus acidophilus, Lactobacillus bulgaricus, Lactobacillus lactis,* and mixtures thereof.

4,525,352

ANTIBIOTICS

Martin Cole, Dorking; Thomas T. Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group p.l.c., England

Continuation of Ser. No. 964,035, Nov. 27, 1978, abandoned, which is a continuation of Ser. No. 726,480, Sep. 24, 1976, abandoned, which is a division of Ser. No. 569,007, Apr. 17, 1975. This application Dec. 3, 1981, Ser. No. 327,253

Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74

Int. Cl.[3] **A61K** *35/00*

U.S. Cl. 424—114 **65 Claims**

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of clavulanic acid and an antibacterially effective amount of amoxycillin, in combination with a pharmaceutically acceptable carrier.

4,525,353

ANTIBIOTICS

Martin Cole, Dorking; Thomas T. Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group p.l.c., England

Continuation of Ser. No. 78,959, Sep. 26, 1979, abandoned, which is a division of Ser. No. 964,035, Nov. 27, 1978, abandoned, which is a continuation of Ser. No. 726,480, Sep. 24, 1976, abandoned, which is a division of Ser. No. 569,007, Apr. 17, 1975,. This application Feb. 26, 1982, Ser. No. 352,951

Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74; Ireland, Apr. 8, 1975, 792/75

Int. Cl.[3] **A61K** *35/00*

U.S. Cl. 424—114 **55 Claims**

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of clavulanic acid or a pharmaceutically acceptable salt thereof and an antibacterially effective amount of ticarcillin, a pharmaceutically acceptable salt thereof or the phenyl, tolyl or indanyl ester thereof, in combination with a pharmaceutically acceptable carrier.

4,525,354

ANTIBIOTIC AND PROCESS FOR THE PRODUCTION THEREOF

Robert G. Birch, Brighton, Australia, and Suresh S. Patil, Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed Sep. 14, 1983, Ser. No. 531,879

Int. Cl.[3] **A61K** *35/74;* **C12P** *1/04, 1/02*

U.S. Cl. 424—115 **3 Claims**

1. The antibiotic albicidin when produced by culturing *Xanthomonas albilineans* strain NRRL B-15550 at a temperature between 15° C. and about 37° C. in an aqueous nutrient culture medium under aerobic fermentation conditions until a substantial amount of antibiotic activity is produced, said antibiotic being a white crystalline compound sparingly soluble in water, soluble in polar organic solvents, and substantially insoluble in non-polar organic solvents; has a molecular weight of about 842; has the following proton magnetic resonance spectrum;

^{1}HNMR (DMSO-d_6, 300 MHz; δ11.567 (1H, br s), 11.178

(1H, s), 10.597 (1H, s), 10.131 (1H, s), 9.802 (1H, br s), 9.719 (1H, s), 9.042 (1H, d, J=7.8 Hz), 8.039 (1H, d, J=8.8 Hz), 8.009 (1H, d, J=8.8 Hz), 7.939 (1H, d, J=8.9 Hz), 7.870 (1H, d, J=8.9 Hz), 7.828 (1H, d, J=8.8 Hz), 7.811 (1H, d, J=8.8 Hz), 7.600 (1H, br d, J=8.8 Hz), 7.372 (2H, d, J=8.8 Hz), 7.287 (1H, br, q, J=1.2 Hz), 6.858 (2H, d, J=8.8 Hz), 5.003 (1H, br td, J=8.5, 7.8, and 5.6 Hz), 3.931 (3H, s), 3.795 (3H, s), 3.165 (1H, dd, J=−16.9 and 5.6 Hz), 3.097 (1H, dd, J=−16.9 and 8.5 Hz), 2.136 (3H, d, J=1.2 Hz); has the following carbon ^{13}NMR spectrum:

^{13}C NMR (DMSO-d_6, 75 MHz): δ168.89 (s), 168.19 (s), 166.17 (s), 164.86 (s), 163.30 (s), 157.52 (s), 154.49 (s), 149.72 (s), 142.70 (s), 141.86 (s), 140.26 (s), 137.76 (s), 136.15 (s), 135.90 (s), 133.92 (d), 131.31 (d, 2C), 129.51 (s), 128.99 (s), 128.80 (d), 128.36 (d), 127.65 (s), 126.55 (s), 125.70 (d), 125.48 (d), 119.14 (d), 118.95 (d), 118.22 (s), 116.25 (s), 115.39 (d, 2C), 114.94 (d), 110.20 (d), 60.56 (q), 60.22 (q), 50.62 (d), 20.03 (t), 14.57 (q); which has the following ultraviolet absorption spectrum:

λmax 308 nm with shoulder at 275 nm in aqueous solution, pH 7, 0.01M tris-HCl buffer,

λmax 213 nm and λmax 308 nm in methyl alcohol (10 mcg/ml), $E_{1\ cm}^{1\%}=8\times10^2$,

λmax 320 nm with shoulder at 350 nm in 0.06N potassium hydroxide in methyl alcohol; and which is stabile for 3 hours at 37° C. to a concentration of the proteolytic enzyme pronase of about 50 μg/ml.

4,525,355

7-β-UREIDOACETAMIDO-OXACEPHALOSPORINS

Masayuki Narisada, Ibaraki; Fumihiko Watanabe, Osaka; Tetsuo Okada, Sakai, and Hiromu Matsumura, Ashiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

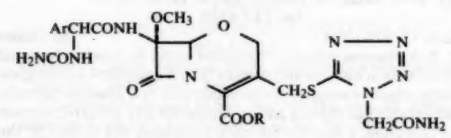
Filed Dec. 27, 1983, Ser. No. 566,023

Claims priority, application Japan, Dec. 27, 1982, 57-229358

Int. Cl.[3] A61K *31/535;* **C07D** *498/04*

U.S. Cl. 514—210 **7 Claims**

1. A 7β-ureidoacetamido-7α-methoxy-3-(1-carbamoylmethyl-1H-tetrazol-5-yl)thiomethyl-1-dethia-1-oxa-3-cephem-4-carboxylic acid derivative represented by the following formula:



wherein Ar is phenyl, hydroxyphenyl, or thienyl and R is hydrogen, a light metal, or a carboxy-protecting group.

7. A method for combating bacteria which comprises bringing an effective amount of the compound as claimed in claim 1 to contact with the bacteria.

4,525,356

N-SUBSTITUTED FLAVONE-8-CARBOXAMIDES

Yasuo Itho, Katsuyamashi; Hideo Kato, Fukuishi; Nobuo Ogawa, Katsuyamashi; Kagari Yamagishi, Katsuyamashi; Eiichi Koshinaka, Katsuyamashi, and Kazuya Mitani, Fukuishi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi, Japan

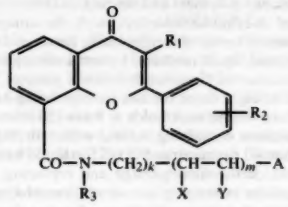
Filed Oct. 28, 1983, Ser. No. 546,481

Claims priority, application Japan, Nov. 2, 1982, 57-191803; Feb. 25, 1983, 58-29409; Apr. 4, 1983, 58-57868; May 9, 1983, 58-79343; Jul. 28, 1983, 58-136735

Int. Cl.[3] A61K *31/35, 27/00;* **C07D** *311/30, 405/10*

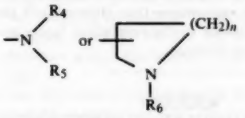
U.S. Cl. 514—234 **18 Claims**

1. N-substituted flavone-8-carboxamide represented by the formula (I):



(I)

wherein R_1 represents a hydrogen atom, a methyl group or an ethyl group; R_2 represents a hydrogen atom, a lower alkyl group, a lower alkoxyl group, a hologen atom or a nitro group; R_3 represents a hydrogen atom or a lower alkyl group; k represents 0, 1, 2, or 3; m represents 0 or 1; X and Y, which must be different, represent a hydrogen atom or a methyl group; A represents an amino group having the formula



wherein, R_4 and R_5, which may be the same or different, represent a lower alkyl group or a cyclic amino group together with the nitrogen atom and with or without an oxygen atom to constitute a piperidino, pyrrolidino or morpholino group; R_6 represents a lower alkyl group and n represents 2 or 3; and pharmaceutically acceptable acid addition salts thereof.

17. A method for the treatment of a subject in need of elimination of an impediment to micturition, comprising the step of administering to a said subject an amount of a compound of claim 1 which is effective for such purpose.

4,525,357

DERIVATIVES OF BICYCLIC 2-IMINOTHIAZOLIDINE OXIMES

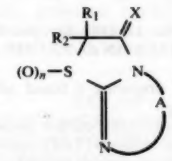
Dean F. Bushey, and Themistocles D. J. D'Silva, both of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 163,496, Jun. 27, 1980, Pat. No. 4,405,632. This application Jun. 24, 1983, Ser. No. 507,335

Int. Cl.[3] C07D *487/00;* **A61K** *31/53*

U.S. Cl. 514—258 **21 Claims**

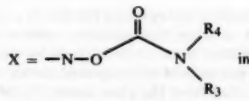
1. Compounds of the formula:



wherein

R_1 and R_2 are the same or different and are individually hydrogen, C_1-C_6 alkyl or halogen;

n=0,1 or 2;



including E & Z isomers;

A is an acyclic, cyclic, or bicyclic alkylene or alkenylene group, or an ortho-substituted phenylene group which forms an unsaturated six membered heterocyclic ring which can also have nitrogen, or carbonyl in addition to the two nitrogens, said alkylene, alkenylene, or phenylene ring systems being optionally substituted with one or two C_1-C_4 alkyl, cyclohexyl, alkoxy, phenoxy, alkylthio halogen, amido, alkylamido, nitrile, or nitro groups;

R_3 and R_4 may be the same or different and are individually hydrogen, C_1-C_4 alkyl or C_1-C_4 alkanoyl which can be substituted with one or two halogens and in the case when R_3 is alkyl R_4 can also be $-(S)_y-R_5$ wherein:

y=1 or 2;

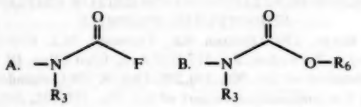
R_5=

(a)C_1-C_{18} alkyl, C_3-C_8 cycloalkyl or perhaloalkyl:

(b) dialkyl amino, pyrrolidino, or group each of which may be unsubstituted or substituted with one or two alkyl groups; or

(c) a phenyl group which may be unsubstituted or substituted with one or two alkyl, chloro, fluoro, cyano, nitro, alkoxy, trifluoromethyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy alkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, or dialkylamino: or

(d) a group of the formula:



wherein:

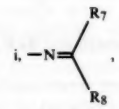
R_6 is:

(1) C_1-C_{12} alkyl, alkoxyalkyl, or a phenylalkyl group; or

(2) a phenyl group which may be unsubstituted or substituted with one or two C_1-C_{12} alkyl, chloro, fluoro, alkoxy, alkylthio, alkylthioalkyl, alkylsulfinyl, alkylsulfinylalkyl, alkylsulfonyl, alkyl sulfonylalkyl, alkynyloxy, dialkylamino, alkoxy imino, formamidino, cyano, dioxolanyl, or dithiolanyl groups in any combination; or

(3) a naphthyl, tetrahydronaphthyl, dihydrobenzofuranyl, benzodioxolanyl, or benzothienyl group all of which may be unsubstituted or substituted with one or two alkyl groups; or

(4) a group of the formula



wherein:

R_7 is chloro, alkyl, alkoxy, alkylthio, cyanoalkylthio, amidoalkylthio or cyano group; or R_7 is hydrogen provided R_8 is not hydrogen;

R_8 is an alkyl, alkylthio, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylthioalkyl, cyanoalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkoxyalkyl, nitroalkyl, hydroxyalkyl, haloalkyl, or phenyl group; said phenyl group may contain one or two alkyl, chloro, or fluoro groups in any combination; or R_8 is hydrogen provided R_7 is not hydrogen;

with the proviso that when R_6 is a phenyl group substituted with an alkyl group, no single alkyl or alkylene moiety in any R_5, R_6, R_7, or R_8 group can include more than eight carbon atoms except where indicated.

4,525,358

2-[4-(DIPHENYLMETHYL)-1-PIPERAZINYL]-ACETIC ACIDS AND THEIR AMIDES

Eugène Baltes, Rhode-St.Genese; Jean de Lannoy, and Ludovic Rodriguez, both of Brussels, all of Belgium, assignors to UCB Pharmaceuticals, Inc., Dover, Del.

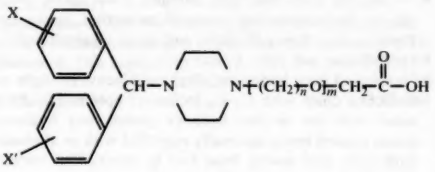
Continuation of Ser. No. 345,918, Feb. 4, 1982, abandoned. This application May 17, 1983, Ser. No. 496,489

Claims priority, application United Kingdom, Feb. 6, 1981, 8103768; Apr. 8, 1981, 8110990

Int. Cl.[3] **A61K** *31/50;* **C07D** *295/14*

U.S. Cl. 514—255 **31 Claims**

1. A compound of the formula



wherein

X and X′ represents independently a hydrogen atom, a halogen atom, a straight or branched chain lower alkoxy radical or a trifluoromethyl radical,

m is 1 or 2, and

n is 1 or 2

or a non-toxic pharmaceutically acceptable salt thereof.

4,525,359

TREATMENT FOR SELECTIVE WEIGHT CONTROL

Frank L. Greenway, III, 4560 Admiralty Way, Ste. 301, Marina del Rey, Calif. 90291, and George A. Bray, 234 S. Figueroa, #1035, Los Angeles, Calif. 90012

Filed Dec. 10, 1982, Ser. No. 448,836

Int. Cl.[3] **A61K** *31/48, 31/245, 31/135*

U.S. Cl. 514—653 **16 Claims**

1. A process for achieving a selective reduction in body weight, comprising the steps of:

delivering specifically to the portion of the body where weight reduction is sought a therapeutically effective amount of a beta adrenergic stimulator and

accomplishing a general weight loss program whereby an acceleration of weight loss is achieved from the portion of the body to which the beta adrenergic stimulator was selectively delivered.

4,525,360

ANTI-PSYCHOTIC PHENYLINDENE DERIVATIVES AND ACID ADDITION SALTS THEREOF

Jens K. Perregaard, Olstykke, Denmark, assignor to Kefalas A/S, Copenhagen, Denmark

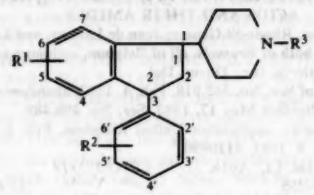
Filed Oct. 5, 1983, Ser. No. 539,308

Claims priority, application United Kingdom, Oct. 7, 1982, 8228729

Int. Cl.[3] **A61K** *31/44, 31/445;* **C07D** *401/06, 211/08*

U.S. Cl. 514—277 **12 Claims**

1. (1) A compound selected from the group consisting of a 3-phenylindene-1 or 3-phenylindene-2 having the following formula:



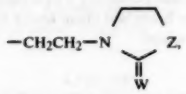
I

wherein the other dotted lines indicate optional bonds;

R^1 is selected from hydrogen, halogen, lower alkyl, lower alkoxy, hydroxymethyl, lower alkoxymethyl, cyano, trifluoromethyl, lower alkylthio and lower alkylsulfonyl;

R^2 is 4'-fluoro; and

R^3 is selected from hydrogen, alkyl and alkenyl (straight or branched chain with C_1–C_6 inclusive) optionally substituted with one or two hydroxy groups, any hydroxy group present being optionally esterified with an aliphatic carboxylic acid having from two to twenty-four carbon atoms inclusive, and the group



wherein Z is selected from NR^4, O and S, where R^4 is selected from H and lower alkyl, and W is selected from O and S, and

(2) a pharmaceutically acceptable acid addition salt thereof.

11. A method for the treatment of psychic disorders in warm-blooded animals, including human beings, by administering an effective quantity of a compound of claim 1 or 2.

4,525,361

ARALKYL CARBOXYLIC ACID COMPOUNDS IN COMPOSITIONS FOR POTENTIATING IMMUNO ACTIVITY

Hiroshi Morimoto, Nishinomiya; Isuke Imada, Izumi; Masazumi Watanabe, Takatsuki, and Mitsuru Kawada, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

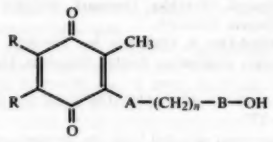
Division of Ser. No. 221,613, Dec. 31, 1980, Pat. No. 4,407,757, which is a division of Ser. No. 961,021, Nov. 15, 1978, Pat. No. 4,271,083, which is a division of Ser. No. 573,158, Apr. 30, 1975, Pat. No. 4,139,545. This application May 23, 1983, Ser. No. 497,014

Claims priority, application Japan, May 2, 1974, 49-50003

Int. Cl.³ A61U *31/12, 31/19, 31/045, 31/235*

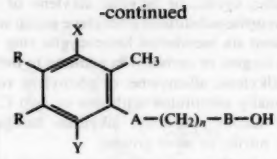
U.S. Cl. 514—689 **7 Claims**

1. A pharmaceutical composition suitable for potentiating immuno activity in a mammal, which comprises, as an active ingredient, a pharmaceutically effective amount of at least one compound selected from the group consisting of



and

-continued



wherein R represents alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, A represents —CH_2—, —CO— or

B represents —CH_2— or —CO—, n represents an integer of 1 to 8, X represents hydrogen or hydroxyl and Y represents hydroxyl, or the corresponding ester with methanol at the function shown by —B—OH when B is —CO—, or the corresponding ester with acetic acid at the function shown by —B—OH when B is —CH_2—, together with a pharmaceutically acceptable carrier therefor.

4,525,362

MOSQUITO DEVELOPMENT INHIBITOR EMPLOYING SUBSTITUTED PHENOLS

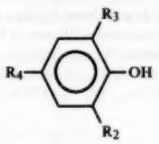
Sol J. Barer, 130 Tillotson Rd., Fanwood, N.J. 07023, and Henry A. Terwedow, Jr., 317 Hill Ave., Glen Ellyn, Ill. 60137

Continuation of Ser. No. 310,206, Oct. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 276,101, Jun. 22, 1981, abandoned, which is a continuation of Ser. No. 208,230, Nov. 19, 1980, abandoned. This application Mar. 1, 1984, Ser. No. 583,791

Int. Cl.³ A01N *31/00, 31/08*

U.S. Cl. 514—712 **5 Claims**

1. A method of inhibiting the development of mosquito larvae to the adult stage which comprises applying to the larvae an amount effective to inhibit development of the mosquito larvae to the adult stage of a compound having the formula



wherein R_2 and R_3 are styryl, and R_4 is hydrogen, methyl or nonyl.

4,525,363

SINGLE COMPATIBILIZING AGENTS FOR ELASTOMER-RESIN COMBINATION GUM BASE

Ronald P. D'Amelia, Hicksville, N.Y.; John J. Stroz, Monroe, and Roy White, Somers, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 29, 1983, Ser. No. 509,262

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—3 **18 Claims**

1. A homogeneous gum base composition consisting essentially of, in weight %,

about 5 to 75% of polyvinyl acetate resin

about 3 to 30% of elastomer selected from the group consisting of styrene-butadiene copolymer and polyisobutylene,

about 0.5 to 50% of a polymer selected from the group consisting of

ethylene-vinyl acetate copolymer,

polyethylene adipate
poly 1,4 butylene adipate
poly 1,3 butylene glycol adipate,
polypropylene glycol glutarate,
polypropylene glycol adipate, and
polypropylene glycol azelate
about 0 to 60% of inorganic filler
about 0 to 18% of wax
about 0 to 10% of hydrogenated vegetable or animal fat
about 0 to 10% of emulsifier
about 0 to 10% of ester gum
and, optionally, colorant, pigment and antioxidant.

4,525,364

FLAVORING WITH A MACROCYCLIC CARBONATE

Wilhelmus J. Wiegers, Red Bank, N.J.; Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Luccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 511,909, Jul. 8, 1983, Pat. No. 4,490,544. This application Jun. 22, 1984, Ser. No. 623,446

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—3 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of adding to said foodstuff or chewing gum from 0.0001 parts per million up to about 50 parts per million by weight based on total composition of a macrocyclic carbonate having the structure:

4,525,365

COATED FROZEN-DESSERT AND A PROCESS FOR PREPARATION THEREOF

Yukiteru Kato, and Kazuhiro Watanabe, both of Urawa, Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,904

Int. Cl.³ A23G *9/00, 9/24*

U.S. Cl. 426—101 **6 Claims**

1. A process for preparing a coated frozen dessert, which comprises adding saccharides and water to amylopectin starch with the weight ratio of the starch to the saccharides being in the range of 1:1 to 1:2.5 and the water being present in the amount of 20–40% by weight of the whole, kneading and heating the mixture thus produced, adding to the kneaded mixture further saccharides and further water and further kneading the mixture to form a viscoelastic material, cooling and forming the material into a layer, encasing a frozen dessert in the layer, and cooling the resulting product.

4,525,366

PROCESS FOR TREATING A MILK SERUM PRODUCT

René J. M. Bolzer, Brece, and Jean Clanchin, Noyal sur Vilaine, both of France, assignors to Laiterie Triballat, Noyal sur Vilaine, France

Filed Apr. 25, 1983, Ser. No. 488,446

Claims priority, application France, Apr. 29, 1982, 82 07402

Int. Cl.³ A23C *9/14*

U.S. Cl. 426—271 **7 Claims**

1. Process for treating a milk serum product in order to delipidate it and free it from microorganisms, which comprises adjusting the pH of the milk serum product to a pH in the range of from about 4.3 to 5.0, causing coagulation in the pH-adjusted milk serum product by heating it to a temperature at which a milk casein substance will coagulate within the adjusted pH range and adding, to the pH-adjusted milk serum product a milk casein substance having a pH of less than about 3.5, and then separating the coagulated material from the treated milk serum product.

4,525,367

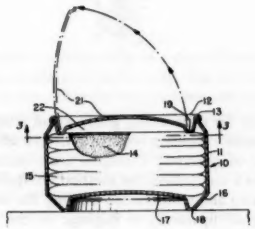
METHOD FOR PREPARING AN EXPANDED FOOD PRODUCT

George E. Allison, 1101 New Hampshire Ave., NW., Washington, D.C. 20037

Continuation of Ser. No. 298,872, Sep. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 63,243, Aug. 3, 1979, abandoned. This application Nov. 2, 1983, Ser. No. 547,913

Int. Cl.³ A23L *1/18*

U.S. Cl. 426—394 **13 Claims**



1. A process for preparing an expanded food product which comprises providing a mercantile container and structuring said container to include on its surface a pre-designated area that is self-rupturable due to internal pressure sufficient to rupture said area, filling said container with a water-containing, edible, expandable mixture, and heating said mixture-containing container, said mixture containing sufficient water and said heating being at a sufficient temperature for a sufficient length of time to cause the vapor pressure of water in the expandable mixture to increase sufficiently to cause the confining means to spontaneously self-rupture in the pre-designated area and cause the expandable mixture to burstingly expand through the ruptured area to produce a substantially intact, expanded product.

4,525,368

BLANCHING OF MUSHROOMS

Bengt L. Bengtsson, Bjuv; Peter Palmlin, Hälsingborg, both of Sweden, and Jan Ekholm, Valladolid, Spain, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 15, 1984, Ser. No. 580,390

Claims priority, application European Pat. Off., Apr. 2, 1983, 83103282.6

Int. Cl.³ A23B *7/06*

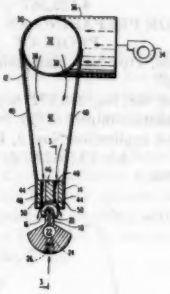
U.S. Cl. 426—438 **4 Claims**

1. A process for blanching mushrooms while substantially preserving their weight and texture comprising treating the mushrooms with an edible frying oil at a temperature from 120° C. to 220° C. for a period of from 2.5 to 30 seconds to blanch the mushrooms, then separating the mushrooms from the frying oil and then deep freezing the oil-blanched mushrooms.

4,525,369
APPARATUS AND METHOD FOR SUPPORTING, GUIDING AND TEMPERATURE-TREATING A PUFF EXTRUDED FOOD PRODUCT

David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 22, 1984, Ser. No. 623,410
Int. Cl.[3] A23L *1/28*
U.S. Cl. 426—446 8 Claims



6. A method for supporting, guiding and temperature-treating a continuously moving rope of puff extruded farinaceous food material of generally C-shaped cross-section exiting the extruder from a die orifice, the method comprising:

(a) supporting and temperature-treating the moving rope by directing air upwardly to impinge on the inner concave surface of the C-shaped cross-section;

(b) restraining upward and lateral movement of the rope and temperature-treating the rope by directing air downwardly to impinge on the top and sides of the outer, convex surface of the C-shaped cross-section; and

(c) guiding the moving rope along the upper edge of a former bar which extends into the inner concave portion of the C-shaped cross-section.

4,525,370
WATER TYPE BLANCHER

Richard B. Parkes, Wyncote, Pa., assignor to National Drying Machinery Co., Philadelphia, Pa.

Filed Jun. 14, 1984, Ser. No. 620,723
Int. Cl.[3] A23B *7/06*; A23N *12/00*
U.S. Cl. 426—508 18 Claims

1. A water type vegetable blancher comprising

a frame;

an elongated tank supported upon the frame, the tank comprising a bottom and sidewalls extending upwardly from the bottom;

conveyor means operatively carried above the tank bottom and adapted to transport the vegetables longitudinally of the tank;

deluge means above the conveyor means to hot water blanch the vegetables,

the deluge means comprising a header and a plurality of spaced branches in fluid communication with the header, and deluge heads connected to the branches, the deluge heads being adapted to flood the vegetables with hot water as they are transported by the conveyor means, the hot water falling into the tank through the conveyor means after blanching;

drain means in the bottom of the tank to remove the blanching water; and

water feed means to supply water under pressure to the deluge heads,

the water feed means comprising a pump having its discharge connected to the header and means to heat the water sufficiently to effect hot water blanching of the vegetables.

10. The method of blanching raw vegetables having enzymes comprising

loading the vegetables upon a conveyor and transporting the vegetables through a blanching apparatus for a predetermined period of time;

heating a quantity of water to a preselected temperature for vegetable blanching purposes;

pumping the heated water to a plurality of spaced pipes located above the conveyor;

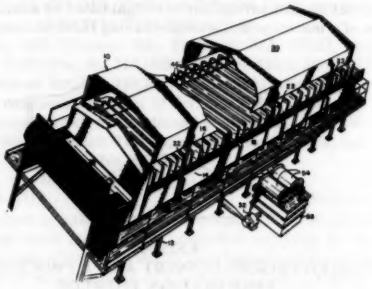
discharging the heated water from the pipes and flooding the vegetables upon the conveyor with quantities of heated water for a preselected period of time; and

water blanching the vegetables upon the conveyor to inactivate the enzymes.

4,525,371
LECITHINATED NOODLES AND PROCESS FOR MANUFACTURE THEREOF

William A. Blemlek, Pequannock, N.J., assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Oct. 25, 1982, Ser. No. 436,391
Int. Cl.[3] A23L *1/16*
U.S. Cl. 426—557 7 Claims



1. A process for producing egg noodles comprising the steps of mixing eggs with lecithin of about 60–90% purity under conditions of time and temperature sufficient to produce a slurry, blending the slurry with flour under conditions of time and temperature sufficient to produce a dough of bread-like consistency, extruding the dough to form noodles, cutting the noodles into pieces and drying the noodles to a uniform stable moisture.

4,525,372
LIGHT CONDIMENT HAVING A MUSTARD BASE AND A PROCESS FOR ITS PREPARATION

Claude Giddey, Geneva, and Georges Dové, Carouge, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Mar. 26, 1984, Ser. No. 593,642
Claims priority, application Switzerland, Mar. 25, 1983, 1651/83
Int. Cl.[3] A23L *1/225, 1/22*
U.S. Cl. 426—564 11 Claims

1. A seasoning or light condiment in the form of a mousse which comprises:

(a)

(i) grains of ground mustard in an amount of 18 to 35% by weight of the total composition of the condiment;

(ii) vinegar amounting to 1.5 to 4% by weight of the total composition of the condiment in terms of acetic acid content; and

(iii) water amounting to 50 to 70% by weight of the total

composition of the condiment; and which further comprises:

(b)

(i) an effective amount of a foaming or swelling agent;

(ii) an effective amount of a stabilizing agent; and

(iii) an inert gas or air dispersed throughout the condiment in such a manner that the density of the mousse is less than or equal to 0.9.

4,525,373

PROCESS FOR MANUFACTURING FLAVORED AND PATTERNED TOFU

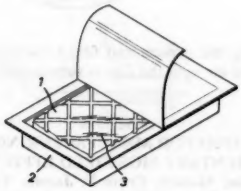
Yaoji Hosaka, Yashio, Japan, assignor to Toyu Food Co-Operative Corporation, Saitama, Japan

Filed Jun. 1, 1983, Ser. No. 499,990

Claims priority, application Japan, Nov. 19, 1982, 57-201843

Int. Cl.³ A23P *1/00*; B28B *1/26*

U.S. Cl. 426—634 **1 Claim**



1. A process for manufacturing a flavored and patterned tofu, the steps comprising:

preparing a tofu material by adding a coagulating agent to a soybean soup;

placing said prepared tofu material upon a pattern-mounted plate which is disposed in a bottom of a perforated container;

placing a weight upon a surface of said prepared tofu material in said container, thereby pressing said surface against said pattern-mounted plate by pressure of the weight to provide a predetermined pattern on the surface of said tofu material;

cutting the tofu material provided with such a pattern treatment into a number of pieces;

positioning one piece of tofu in a plastic pack;

pouring a solution having a flavor into the plastic pack to immerse said one piece of tofu therein; and

sealing said plastic pack, said tofu piece remains in said sealed plastic pack for a predetemined period of time whereby the flavor is penetrated into the interior of the tofu piece.

4,525,374

TREATING HYDROPHOBIC FILTERS TO RENDER THEM HYDROPHILIC

Vincent L. Vaillancourt, Livingston, N.J., assignor to Manresa, Inc., Hillsdale, N.J.

Filed Feb. 27, 1984, Ser. No. 583,629

Int. Cl.³ A01N *1/02*; B05D *5/00*

U.S. Cl. 427—2 **6 Claims**

1. A method of coating a hydrophilic filter membrane to render said membrane hydrophilic, said method including the steps of coating a polypropylene membrane whose pore size is not larger than two (2) microns with a Triethanolamine Dodecylbenzene Sulfonate (LAS) chemical solution so that said polypropylene membrane is rendered hydrophilic and medically acceptable.

4,525,375

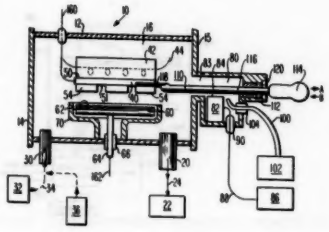
METHOD OF CONTROLLONG THE DEPOSITION OF HYDROGENATED AMORPHOUS SILICON AND APPARATUS THEREFOR

Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,449

Int. Cl.³ B05D *3/06*; C23C *13/08*

U.S. Cl. 427—8 **12 Claims**



1. An apparatus for deposition of a doped layer of hydrogenated amorphous silicon or semiconducting alloys thereof on a substrate, or the like, wherein the outermost layer of the deposited material generates a photovoltage in response to radiation indicative of the level and type of doping comprising:

(a) a reactor having an evacuable chamber;

(b) a support means disposed within said chamber for supporting said substrate;

(c) means in communication with said chamber for evacuation thereof;

(d) inlet means in communication with said chamber for introducing a reactant gas into said chamber;

(e) charging means for forming a plasma from said reactant gas adjacent the surface of said substrate and inducing a glow discharge;

(f) illumination means for illuminating the surface of said substrate with radiation having a predetermined wavelength;

(g) measurement means for measuring the photovoltage at the outermost surface of said illuminated substrate; and

(h) means for admixing amounts of p type dopant or n type dopant to said reactant gas in response to said measured photovoltage.

9. A method for deposition of a doped layer of hydrogenated amorphous silicon or semiconducting alloys thereof on a substrate wherein the outermost layer of the deposited material generates a photovoltage in response to radiation indicative of the level and type of doping comprising the steps of:

(a) loading at least one substrate into a chamber of a reactor;

(b) heating said at least one substrate;

(c) evacuating said chamber to a subatmospheric pressure;

(d) introducing a reactant gas at subatmospheric pressure into said chamber so that a continuous flow of said reactant gas is effected over a surface of said at least one substrate;

(e) applying a voltage to said reactant gas whereby a plasma is formed within the chamber adjacent said surface causing a glow discharge to occur which results in the deposition of said doped layer;

(f) illuminating said doped layer with said radiation;

(g) measuring the photovoltage at the outermost surface of said doped layer; and

(h) admixing amounts of p type dopant or n type dopant to said reactant gas in response to said measured photovoltage to achieve a desired level and type of doping of the deposited layer.

10. The method as set forth in claim 9 wherein said radiation has a wavelength between 3000 angstroms and 5000 angstroms.

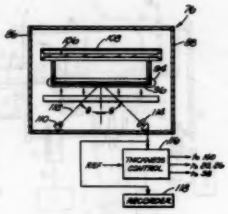
4,525,376
OPTICAL METHODS FOR CONTROLLING LAYER THICKNESS

Robert F. Edgerton, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 244,387, Mar. 16, 1982, abandoned. This application Dec. 7, 1982, Ser. No. 447,390

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—10 **2 Claims**



1. A method for controlling the thickness of a layer of material deposited upon a substrate comprising the steps of:

providing a plurality of glow discharge chambers;

providing a flexible substantially continuous sheet of substrate material;

advancing said substrate successively through said glow discharge chambers at a selected speed;

providing a flow of reaction gases to each of said chambers;

providing an Rf power source with an Rf output for generating a plasma from said reaction gases in each of said chambers to uniformly deposit a layer of materials upon said substrate in each of said chambers;

projecting a single continuous white light beam toward the side of said substrate upon which said layers are being deposited and the beam being reflected in a single beam therefrom;

providing an optical detector and directing said reflected white beam to said detector, and distinguishing the intensity of said reflected white light beam as a function of wavelength; and

determining the thickness of said layers upon said substrate by comparing the intensity as a function of wavelength of said reflected white light beam with the intensity as a function of wavelength of a reference signal which is related to said projected beam, and controlling the thickness of said material being deposited on said substrate in proportion to said reference signal by varying at least one of the output of said Rf power source, the speed at which said substrate is advanced through said chambers and the flow of said reaction gases into said chambers.

4,525,377
METHOD OF APPLYING COATING

Gerhard E. B. Nickel, Kennesaw, and Alfred C. Alberghini, Dunwoody, both of Ga., assignors to Sewell Plastics, Inc., Atlanta, Ga.

Filed Jan. 17, 1983, Ser. No. 458,347

Int. Cl.³ B05D *1/18*

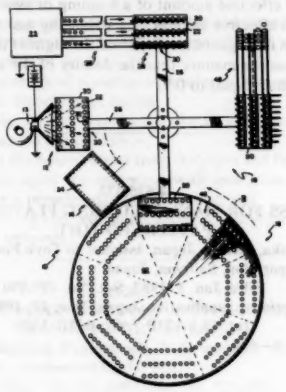
U.S. Cl. 427—12 **8 Claims**

1. A method for producing a parison of amorphous PET having an outside coating comprising the steps of:

(a) deionizing the surface of an amorphous PET parison;

(b) dipping the parison into an aqueous PVDC dispersion;

(c) withdrawing the parison and an adherent film of the PVDC dispersion below the rate at which film slubbing is observed; and



(d) exposing the parison and film to ambient temperature desiccated air until the film is substantially dried.

4,525,378
METHOD FOR MANUFACTURING VLSI COMPLEMENTARY MOS FIELD EFFECT CIRCUITS

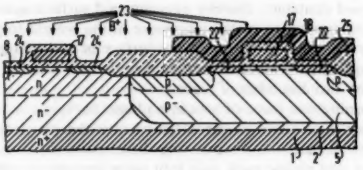
Ulrich Schwabe, Munich; Erwin P. Jacobs, Vaterstetten, and Franz Neppl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,590

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330851

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **7 Claims**



1. A method for manufacturing VLSI complementary MOS field effect transistor circuits (CMOS circuits) wherein p-doped or n-doped tubs are generated in a semiconductor substrate for acceptance of the n-channel and p-channel transistors of the circuits, corresponding dopant atoms for setting various transistor threshold voltages being introduced into the tubs by ion implantation, a masking being provided for the individual ion implantations, and a manufacture of the source, drain, and gate regions as well as a generation of an intermediate and insulating oxide and of an interconnect level being provided, wherein the improvement comprises the steps of:

(a) employing a gate material having a work function ϕ_M higher than n^+-polysilicon gate material, the work function ϕ_M being matched to a thickness of a gate oxide thickness d_{GOX};

(b) setting the gate oxide thickness d_{GOX} to values in a range from 10 to 30 nm; and

(c) executing a single, common channel ion implantation for p-channel and n-channel transistors, said channel ion implantation being matched such that, with a given gate oxide thickness d_{GOX}, threshold voltages of n-channel and

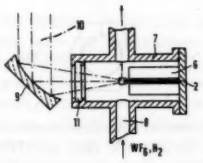
p-channel transistors are symmetrical and have a given value.

4,525,379

METHOD OF MANUFACTURING AN ELECTRODE FOR A HIGH-PRESSURE GAS DISCHARGE LAMP AND ELECTRODE FOR SUCH A LAMP

Horst Hübner, Nümbrecht; Hans Lydtin, Stolberg; Ludwig Rehder, and Thomas Zaengel, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,858
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300449
Int. Cl.³ C23C *11/02*
U.S. Cl. 427—53.1 12 Claims



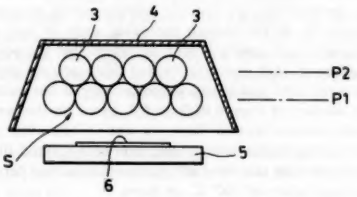
1. A method of manufacturing an electrode for a high-pressure gas discharge lamp, in which a thickened part of a high-melting metal is formed on a carrier of a high-melting metal characterized in that the carrier is coated by reactive deposition from the gaseous phase with a layer protecting against corrosion and then the thickened part is formed by reactive deposition from the gaseous phase.

4,525,380

HEATING METHOD OF SEMICONDUCTOR WAFER

Tetsuji Arai, Tachikawa, and Yoshiki Mimura, Yokohama, both of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,273
Claims priority, application Japan, Mar. 16, 1983, 58-42204
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 4 Claims



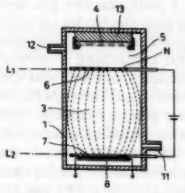
1. A method for heating a semiconductor wafer comprising:
forming a film on an entire surface of the semiconductor wafer so as to make the reflectivity of said entire surface of the wafer uniform,
and heating said entire surface by exposing said entire surface to a flash of light at one time.

4,525,381

PHOTOCHEMICAL VAPOR DEPOSITION APPARATUS

Kazuya Tanaka, and Shinji Sugioka, both of Kawasaki, Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,790
Claims priority, application Japan, Feb. 9, 1983, 58-18777; Feb. 9, 1983, 58-18778
Int. Cl.³ B05D *3/06;* C23C *13/08*
U.S. Cl. 427—54.1 10 Claims



1. A photochemical vapor deposition apparatus comprising a vessel defining a reaction space and a discharge space adjacent to and above said reaction space, an anode of wire netting positioned at a first level and a cathode of wire netting having smaller meshes than the anode arranged in a second level, said first level being closer to said reaction space than said second level, and an electron-emitting substance clogging the meshes on said cathode.

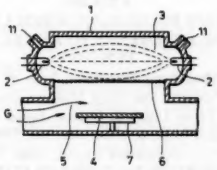
3. A method for depositing material on a substrate by photochemical vapor deposition comprising the steps of:
providing an airtight vessel having a reaction space and an adjacent discharge space;
providing a plurality of spaced discharging electrodes in said discharge space;
placing the substrate in said reaction space;
feeding a photoreactive gas into said vessel;
generating between at least two of said discharging electrodes in a direction generally parallel to a straight line extending between said two discharging electrodes an electric plasma discharge emitting ultraviolet rays; and
impinging the photoreactive gas with the ultraviolet rays outside the electric plasma discharge to cause a photochemical reaction of said photoreactive gas, wherein the step of placing comprises placing the substrate in said reaction space in a position which is in non-perpendicular relation to said direction of plasma discharge.

4,525,382

PHOTOCHEMICAL VAPOR DEPOSITION APPARATUS

Shinji Sugioka, Kawasaki, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,792
Claims priority, application Japan, Jan. 18, 1983, 58-5266
Int. Cl.³ C23C *13/08;* B05D *3/06*
U.S. Cl. 427—54.1 8 Claims



2. A photochemical vapor deposition apparatus comprising:
means, including an air tight vessel, for defining a reaction space into which a substrate is to be placed and a discharge space in which electric plasma discharge is generated for radiating ultraviolet rays, said reaction space

defining a passage for a photoreactive gas, and said ultraviolet rays causing photochemical reaction of said photoreactive gas;

discharging electrodes arranged on opposite sides of said discharge space; and

a grid comprising a wire-netting of metal interposed between said discharge space and said reaction space.

5. A photochemical vapor deposition method for depositing material on a substrate comprising:

providing an air-tight vessel having a reaction space defining a passage for a photoreactive gas, and a discharge space having discharging electrodes on opposite sides;

placing the substrate in the reaction space;

interposing a grid comprising a wire-netting of metal between said reaction space and said discharge space;

feeding photoreactive gas through the reaction space; and

generating electric plasma discharge between said discharging electrodes for radiating ultraviolet rays and transmitting the ultraviolet rays onto said substrate through said grid and said photoreactive gas for causing photochemical reaction of said photoreactive gas to deposit a product material of the photochemical reaction on said substrate.

4,525,383

METHOD FOR MANUFACTURING MULTILAYER CIRCUIT SUBSTRATE

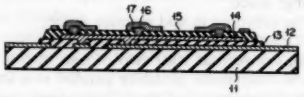
Tamio Saito, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 8, 1982, Ser. No. 415,798

Claims priority, application Japan, Sep. 11, 1981, 56-143476; Nov. 30, 1981, 56-192224; Nov. 30, 1981, 56-192225

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—89 **4 Claims**



1. A method for manufacturing a multilayer circuit substrate comprising the steps of:

providing an insulating substrate formed of an inorganic oxide;

successively and alternately forming wiring pattern layers and insulating layers on said insulating substrate, each of said wiring pattern layers consisting of a copper layer and an adhesive layer, said adhesive layer being deposited on said insulating substrate and each of said insulating layers and each of said copper layers being deposited on each of said adhesive layers and wherein said adhesive layer comprises a first metallic material having a free energy of a formation of oxide higher than that of copper; and

forming, by a low temperature deposition, a layer of an electrically conductive material capable of being subjected to wire bonding of said copper layer.

4,525,384

PROCESS FOR PRODUCING WHOLLY AROMATIC POLYAMIDE FILAMENTS HEAT-TREATED UNDER TENSION

Akihiro Aoki; Shozaburo Hiratsuka, both of Iwakuni; Norihisa Yamaguchi, Mihara, and Shoji Makino, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 6, 1984, Ser. No. 586,792

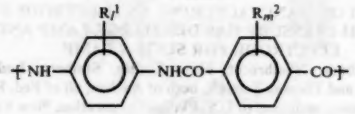
Claims priority, application Japan, Mar. 7, 1983, 58-35774; Mar. 23, 1983, 58-47269; Jul. 7, 1983, 58-122279; Aug. 26, 1983, 58-154915; Aug. 26, 1983, 58-154916

Int. Cl.³ B29C *25/00*

U.S. Cl. 427—174 **17 Claims**

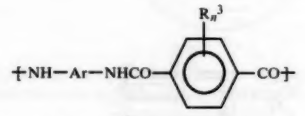
1. A process for producing wholly aromatic polyamide filaments heat-treated under tension, comprising the steps of:

adhering fine particles consisting essentially of an inert inorganic material to peripheral surfaces of wholly aromatic polyamide filaments to be heat-treated under tension and comprising at least one wholly aromatic polyamide having recurring units of the formula (I):



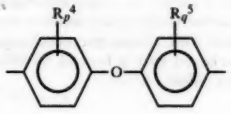
(I)

and at least one type of recurring units selected from those of the formula (II):

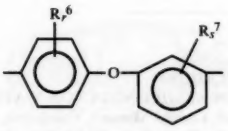


(II)

wherein Ar represents a divalent aromatic radical selected from those of the formulae (III) and (IV):



(III)



(IV)

and R^1, R^2, R^3, R^4, R^5, R^6 and R^7 respectively represent independently from each other, a substituent selected from the group consisting of halogen atoms and alkyl radicals having 1 to 2 carbon atoms, and l, m, n, p, q, r, and s respectively represent, independently from each other, zero or an integer of 1 to 2, the sum of said recurring units of the formulae (I) and (II) corresponding to at least 80 molar % of the overall recurring units in said wholly aromatic polyamide to such an extent that the peripheral surface of said non-heat treated filaments are uniformly covered with said inert inorganic material fine particles in an amount of from 0.01% to 5% based on the weight of said non-heat treated filaments; and

heat-treating under tension said non-heat treated filaments covered with said inert inorganic material fine particles at a temperature of 300° C. or more,

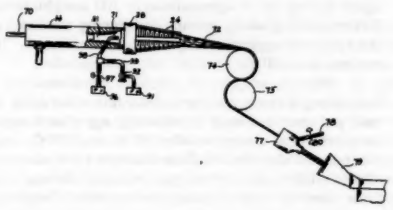
in which process said adhering operation is carried out by applying an aqueous liquid containing said inert inorganic material and then by drying the applied aqueous liquid on said non-heat treated filaments and said inert inorganic material consists essentially of at least one member selected from the group consisting of graphite, talc, colloidal silica, hydrophobic silica and mica.

4,525,385

APPLICATION OF ADDITIVES TO CIGARETTE FILTER TOW

James W. Pryor, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Division of Ser. No. 468,011, Feb. 18, 1983, Pat. No. 4,476,807.
This application Jun. 21, 1984, Ser. No. 622,964
Int. Cl.³ B05D 3/12, 1/02
U.S. Cl. 427—177 13 Claims



1. A process for treating a continuous, multifilament filter tow in connection with the manufacture of filter elements therefrom which comprises

(a) introducing said filter tow and a stream of gaseous fluid into a blooming jet device that includes an elongated filter tow passageway substantially circular in cross-sectional shape and provided with orifice means transversely positioned in said passageway, said orifice means being designed to accommodate passage therethrough of the filter tow and the gaseous fluid moving in co-current fashion,

(b) applying an additive to the filter tow by primary nozzle means concentrically positioned with respect to the advancing filter tow in said passageway at a point that is downstream of said orifice means,

(c) withdrawing the additive-treated filter tow from the blooming jet device by delivery roll means, and

(d) advancing the additive-treated filter tow from said delivery roll means through a stuffer jet and into a condensing horn associated with filter rod-forming means.

4,525,386

TECHNIQUE FOR PROPERTY ENHANCEMENT OF OPEN-CELL FOAM MATERIAL

Morey Weisman, 147-23 Charter Rd., Jamaica, N.Y. 11435

Continuation-in-part of Ser. No. 592,715, Mar. 23, 1984, Pat. No. 4,482,582. This application Nov. 8, 1984, Ser. No. 669,517
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.³ B05D 1/24
U.S. Cl. 427—185 7 Claims

1. A technique for enhancing the properties of a body formed of open-cell, synthetic foam plastic material comprising the steps of:

A feeding particles of a filler having the desired properties into a stream of pressurized air which is projected at high velocity, whereby the particles are fluidized in the stream; and

B directing said air stream toward the surface of the body to cause the particles carried thereby to impregnate the cells of the foam plastic material.

4,525,387

PROCESS FOR METALLIZING THE SURFACE OF A CERAMIC

Yoshihiro Ebata, Kawanishi; Nobuyuki Tamari, Ikeda; Yasuo Toibana, Osaka, and Ryozo Hayami, Takarazuka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,561
Claims priority, application Japan, Jul. 18, 1983, 58-131575
Int. Cl.³ B05D 3/04, 3/10
U.S. Cl. 427—190 13 Claims

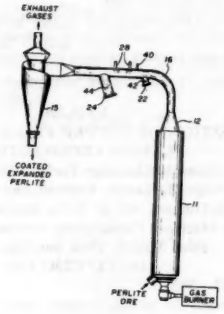
1. A process for metallizing the surface of a ceramic comprising the steps of coating the surface of the ceramic with a mixture of SiO_2 and at least one copper compound selected from the group consisting of copper carbonate, copper sulfate, copper sulfide, copper oxide and copper chloride, heating the coated ceramic at 900° to 1300° C. in an oxidizing atmosphere to form a baked layer on said surface of the ceramic, and then subjecting the ceramic having the baked layer formed thereon to a reduction treatment to form a copper-metallized layer on said surface of the ceramic.

4,525,388

PROCESS FOR EXPANDING AND COATING PERLITE

Thomas E. Rehder, Mundelein, and Terrance L. Williams, Crystal Lake, both of Ill., assignors to USG Corporation, Chicago, Ill.

Filed Dec. 23, 1983, Ser. No. 565,198
Int. Cl.³ B05D 3/02, 3/04, 7/00
U.S. Cl. 427—221 9 Claims



1. A process for manufacturing expanded perlite of the type in which

(a) perlite ore and a stream of hot gases at a temperature above the softening point of perlite are fed to an expansion chamber,

(b) hot expanded perlite in a stream of hot exhaust gases are withdrawn from the expansion zone and conveyed to a separation zone, and

(c) expanded perlite is separated from hot exhaust gases;

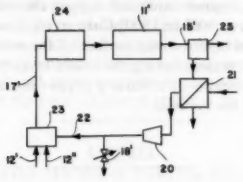
the improvement characterized by, intermediate step (b) and step (c), coating the expanded perlite with a hydrophobic material comprising the steps of (1) adjusting the temperature of the exhaust gases to between about 90° C. and about 375° C.; (2) spraying about 0.01% to about 4.0% by weight of hydrophobic coating material onto the expanded perlite, and (3) maintaining the coated perlite at such temperatures for at least about 3 seconds.

2. The process of claim 1 in which in step (2) the coating material is polydimethyl siloxane.

4,525,389
METHOD FOR CONVEYING AND TREATING A GAS EMPLOYED FOR THE COATING OF WORKPIECES BY MEANS OF A CHEMICAL, HETEROGENEOUS VAPOR-PHASE REACTION

Bruno Stemmler, Karlsfeld, and Hans Zeilinger, Puchheim, both of Fed. Rep. of Germany, assignors to Aktiengesellschaft M.A.N. Maschinenfabrik Augsburg-Nurnberg, Munich, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,741
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245900; Oct. 26, 1983, 3338852
Int. Cl.³ C23C *11/00, 13/00*
U.S. Cl. 427—255.1 **9 Claims**



1. A method for treating and conveying gas mixtures in a coating process through a chemical, heterogeneous vapor-phase reaction in a reaction chamber comprising the steps of:
(a) introducing reactants into said reaction chamber;
(b) extracting the reaction product from said reaction chamber;
(c) separating at least one component of the said extracted reaction product;
(d) dosing said component or components in correlation with said reaction and
(e) reconveying said dosed component or components into said reaction chamber over at least part of the time in which said coating process is carried out.

4,525,390
DEPOSITION OF COPPER FROM ELECTROLESS PLATING COMPOSITIONS

Warren A. Alpaugh, Chenango Forks; William J. Amelio, Binghamton; Voya Markovich, Endwell, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1984, Ser. No. 588,035
Int. Cl.³ C23C *3/02*
U.S. Cl. 427—305 **20 Claims**

1. A process for plating copper onto a substrate which is catalytic for the deposition of copper which comprises plating a first layer of copper onto said substrate from a first alkaline electroless copper plating bath containing about 4 to 7 ppm of cyanide ions and an oxygen content of 1.5 ppm or less; plating a second layer of copper onto said first layer of copper from a second alkaline electroless copper plating bath containing about 8 to 10 ppm of cyanide ion and an oxygen content of about 2.5 to 4 ppm; and wherein values of the oxygen content are for baths at a temperature of about 70° C. to 80° C.

4,525,391
VINYL GUM CURE ACCELERATORS FOR CONDENSATION-CURE SILICONE

Richard P. Eckberg, Roundlake, N.Y., assignor to General Electric Company, Waterford, N.Y.

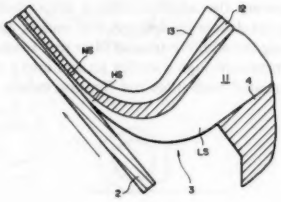
Continuation of Ser. No. 359,480, Mar. 18, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 602,218
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—391 **20 Claims**

1. A silicone release coating composition comprising:
A. A solventless condensation curable composition comprised of:
(i) a silanol-chainstopped linear diorganopolysiloxane base polymer having the formula, $HO—(SiRR'O)_x—H$, where R and R' are the same or different monovalent hydrocarbon radicals free of aliphatic unsaturation, x is a positive integer such that said base polymer has a molecular weight of approximately 2000 to 20,000 and a viscosity of from 25 to 1000 centipoise at 25° C.;
(ii) a polymethylhydrogen siloxane fluid crosslinking agent having up to approximately 100 weight percent SiH-containing siloxy groups and having a viscosity in the range of approximately 25 to approximately 1000 centipoise at 25° C.;
(iii) an effective amount of precious metal catalyst for facilitating a condensation cure reaction between said base polymer and said crosslinking agent at temperatures between, approximately, 90° C. to 300° C.; and
B. an amount of dimethylvinyl-chainstopped polydimethylmethylvinylsiloxane polymer gum effective for accelerating the cure of said condensation curable composition wherein said gum has an average molecular weight of, approximately, 200,000 to 400,000.

4,525,392
METHOD OF SIMULTANEOUSLY APPLYING MULTIPLE LAYERS TO WEB

Keiichi Ishizaki, and Shuzo Fuchigami, both of Kanagawa, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 230,073, Jan. 30, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,780
Claims priority, application Japan, Jan. 30, 1980, 55-9527
Int. Cl.³ B05D *1/30*
U.S. Cl. 427—420 **4 Claims**



1. A method of simultaneously applying multiple layers of coating liquids to a moving web with a slide hopper type coating apparatus comprising the steps of: preparing a first coating liquid for forming the lowermost of said multiple layers so that said first coating liquid, when run at a low shear rate, has a viscosity equal to or different by no more than ± 10 cp from a viscosity of a second coating liquid for forming a layer next to said lowermost layer when said second coating liquid flows at a low shear rate, and that said first coating liquid, when run at a high shear rate has a viscosity lower than a viscosity of said second coating liquid when said second coating liquid flows at a high shear rate; and applying said first and second liquids to said moving web with said slide hopper type coating apparatus.

4,525,393
NOVELTY GREETING GIFT APPARATUS

Pam DiCostanzo, Northbrook, Ill., assignor to PD Giftware Designs, Inc., Deerfield, Ill.

Filed Oct. 4, 1984, Ser. No. 657,610
Int. Cl.³ B44C *5/04*
U.S. Cl. 428—7 **13 Claims**

1. A novelty greeting gift apparatus for conveyance of greet-

ing indicia in a preservable gift environment, said gift apparatus comprising:

first decorative material means stretched into a substantially taut geometric configuration;

inner hoop means having an interior surface and exterior surface;

the bottom peripheral portion of said first decorative tautly stretched material means being closely juxtaposed and overlapping the exterior surface of said inner hoop means;

outer hoop means having an interior surface and exterior surface,

the top peripheral portion of said first decorative tautly stretched material means being closely juxtaposed and underlapping the interior surface of said outer hoop means;

said inner and outer hoop means being concentrically and fixedly juxtaposable proximate to one another with said first decorative material means interposed therebetween so as to maintain said first decorative material means in said substantially taut stretched configuration,

first decorative skirt material means operably attached to the extreme outer circumference of said first decorative material means at a joinder region;

said joinder region being positioned immediately beneath the lowermost edges of said proximately juxtaposed inner and outer hoop means at the location from which said first decorative material means interposed therebetween said inner and outer hoop means emanates downwardly therefrom,

said joinder region serving as an anchor member to effectively lock the position of said first decorative material means in its taut stretched configuration within the respective exterior surface and interior surface of said inner and outer hoop means respectively;

said first decorative skirt material means emanating outwardly from said joinder region beneath said inner and outer hoop means to define a decorative outer skirt member framing said outer loop means;

greeting card means restrainably affixed to the upper surface of said first decorative material means and bearing greeting indicia thereon; and

decorative trim means operably attached to the upper surfaces of one or more of said first decorative material means, inner hoop means, outer hoop means and first decorative skirt means for overall enhancement thereof.

4,525,394

ROSETTE BOW

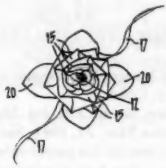
Rosalie K. Standley, 9 Buckingham St., Sydenham, Victoria 3038, Australia

Filed Jan. 23, 1984, Ser. No. 572,844

Int. Cl.³ A41G *1/00*

U.S. Cl. 428—26 **4 Claims**

1. A method of making artificial flowers comprising the steps of rolling one end of a strip of fabric about itself to form the centre of the flower, extending part of the free end of the strip outwardly therefrom, folding the free end in a line at an angle to the axis of the strip to form a petal and locating the petal so formed freely adjacent the central portion, repeating these steps to form the required number of petals and finally



tying the free end of the strip and the lower ends of the petals so formed about the centre of the flower.

4,525,395

SHAPED ARTICLES FROM POLY (P-METHYLSTYRENE) BLENDS

Arthur B. Robertson, Hillsborough, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,360

Int. Cl.³ B32B *27/32*

U.S. Cl. 428—35 **6 Claims**

1. A shaped article of a blend of poly(p-methylstyrene) and between about 0.1 percent and about 10 percent of a polyunsaturated fatty acid sensitizer thermoformed and irradiated with ionizing radiation between about 5 megarads and about 30 megarads to effect cross-linking to render the shaped article resistant to fatty foods under microwave oven conditions.

4,525,396

PRESSURE-RESISTANT PAPER VESSEL

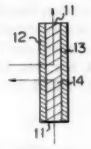
Kenji Takasa, Yokohama, and Masakatsu Nakamura, Kanagawa, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1983, Ser. No. 522,032

Claims priority, application Japan, Aug. 13, 1982, 57-139742; Oct. 15, 1982, 57-180004

Int. Cl.³ B65D *5/40*

U.S. Cl. 428—35 **13 Claims**



1. A pressure-resistant paper vessel having a pressure resistance at normal temperature of higher than atmospheric pressure but not higher than 10 kg/cm² G, at least one surface of said paper vessel with which a pressurized liquid falls into contact, being laminated with a gas barrier plastic film having a carbon dioxide gas permeability of not more than 200; the major portion of the inner surface of said paper vessel with which the pressurized liquid falls into contact, being curved;

said paper vessel being comprised of top and bottom lid members and a vessel barrel portion;

each of said top and bottom lid members being made of pulp, having a thickness of from 0.3 to 3 mm, and having skirt portions on the peripheral edges thereof, with a substantial portion of said lid members having a curved surface, and said skirt portions being substantially free from wrinkles;

said vessel barrel portion being made of a paper having a basic weight of 70 to 500 g/m² and having a cylindrical

configuration comprising a tightly bonded multiple layered structure containing at least two papers.

4,525,397

LIQUID SMOKE TREATED CELLULOSIC FOOD CASINGS

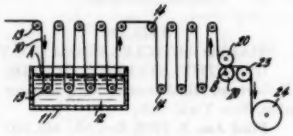
Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 62,358, Jul. 31, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,494

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.³ A22C *13/00*; A23L *1/232*

U.S. Cl. 428—36 **21 Claims**



1. A shirred tubular cellulosic food casing having incorporated in the external surface thereof a substantially tar-free admixture of smoke coloring and flavoring constituents derived from natural wood and including acids and neutralized acids, phenols and carbonyls in an amount of at least about 0.8 mg. per square inch of casing surface, such that the casing external surface is darker then the casing interior surface, said casing being suitable without other smoking procedures for imparting smoke color and flavor to food products processed therein with said smoke color resulting from reactions of said coloring constituents with proteins in the food products.

4,525,398

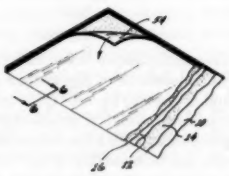
CONDUCTIVE LAMINATE PRODUCT FOR APPLICATION TO VERTICAL AND HORIZONTAL SURFACES

Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Co., Chatsworth, Calif.

Continuation-in-part of Ser. No. 613,088, May 22, 1984, which is a continuation-in-part of Ser. No. 286,611, Jul. 24, 1981, Pat. No. 4,456,944, which is a continuation-in-part of Ser. No. 180,962, Aug. 25, 1980, abandoned. This application Aug. 13, 1984, Ser. No. 640,137

Int. Cl.³ B32B *5/16*, *15/04*

U.S. Cl. 428—40 **9 Claims**



1. As an article of manufacture, a conductive laminate product for application to flat surfaces including vertical and horizontal surfaces comprising in combination a layer of relatively thin, hard plastic material, a thin layer of metallic foil, an electrically conductive adhesive material positioned to bond the foil material to the plastic sheet, and a lamination of backing material secured to the metallic foil, the laminations being bonded together by being pressed together at temperature and pressure.

4,525,399

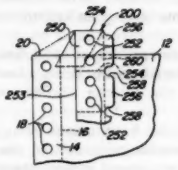
PERFORATED REINFORCING STRIP FOR USE WITH CONTINUOUS FORMS

Robert J. Fields, 2811 Adeline Dr., Burlingame, Calif. 94010

Filed Jun. 6, 1983, Ser. No. 501,509

Int. Cl.³ B32B *3/24*

U.S. Cl. 428—43 **3 Claims**



1. A manufactured article for reinforcing continuous pinfeed forms intended for computer printers comprising a continuous, pliable strip having disposed on one side of said strip a self-adhesive material additionally having a row of holes disposed therein with uniform spacing therebetween, said strip having perforations transverse to the longitudinal axis of the strip and said perforations being disposed between alternative holes of the strip, said strip additionally comprising a plurality of tabs disposed along one edge of the strip said tabs being defined in part by perforations which are disposed within the strip and parallel to the longitudinal axis of the strip.

4,525,400

COMPOSITION FOR PROMOTING ADHESION OF CURABLE SILICONES TO SUBSTRATES

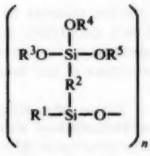
Richard P. Surprenant, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 424,268, Sep. 27, 1982, Pat. No. 4,461,867. This application May 25, 1984, Ser. No. 609,141

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—54 **12 Claims**

1. A diorganocyclopolysiloxane compound of the formula:



wherein R^1 is C_1–C_6 alkyl, C_1–C_6 gamma-trihaloalkyl or phenyl; R^2 is alkylene of from 2 to 6 carbon atoms; R^3, and R^4, and R^5 are, independently, C_1–C_6 alkyl, or C_2–C_6 alkanoyl and n is 3 or 4.

4,525,401

PLASTIC CONTAINER WITH INTERNAL RIB REINFORCED BOTTOM

John F. E. Pocock, Neu-Isenburg, Fed. Rep. of Germany; Gautam K. Mahajan; Suppayan M. Krishnakumar, both of Nashua, N.H., and Kenneth F. M. Friendship, Clarendon Hills, Ill., assignors to The Continental Group, Inc., New York, N.Y.

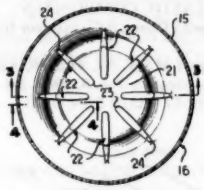
Filed Nov. 30, 1979, Ser. No. 99,057

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—64 **7 Claims**

1. A bottom structure of a thermoplastic bottle, said bottom structure comprising an outer bottom portion having a radially inner lower edge, an inner generally radially and axially concaved bottom portion disposed within said outer bottom por-

tion in recessed relation and having a radially outer lower edge, and a continuous annular generally arcuate cross-sectional intermediate bottom portion joining the lower edges of said outer bottom portion and said inner bottom portion; the improvement of means reinforcing said continuous intermediate bottom portion against deflection, said means being in the form of a plurality of circumferentially spaced radiating solid



ribs formed on an interior surface of said bottom structure and extending at least generally across said continuous intermediate bottom portion, each of said ribs having end portions terminating respectively in said outer bottom portion and said inner bottom portion, said inner bottom portion including an uppermost thickened dome, and said inner ends of said ribs terminating adjacent said dome.

4,525,402

HIGH-DENSITY INFORMATION DISC LUBRICANTS

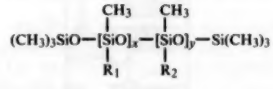
Mohamed E. Labib, Princeton Township, Mercer County, and Eugene S. Poliniak, Willingboro, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 9, 1983, Ser. No. 559,690

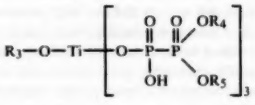
Int. Cl.³ G11B *3/70*; B32B *3/02*

U.S. Cl. 428—64 **5 Claims**

1. In a capacitive electronic disc having a methyl alkyl siloxane lubricant coating thereon, said lubricant being a fractionated and purified material having the formula



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x and y is 4 or less, the improvement wherein said lubricant includes an effective amount of a titanate coupling agent of the formula



wherein R_3 is methyl, ethyl, or isopropyl and R_4 and R_5 are long chain alkyl groups of 8–20 carbon atoms which can be the same or different.

4,525,403

STABILIZED PILE ARTICLE, PRODUCTION AND USE THEREOF FOR THE TREATMENT OF SURFACES

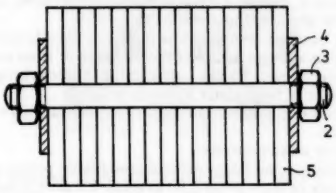
Bernd Hynek, Pulheim; Giselher Valk, Krefeld, and Gerhard Treptau, Grefrath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft and Girmes Vertriebsgesellschaft fur Industrietextilien mbH, both of, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,329

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236518

Int. Cl.³ B32B *3/02, 33/00*

U.S. Cl. 428—87 **6 Claims**



1. A pile article stabilized on the upper surface thereof by an aqueous polymer dispersion, the quantity of the dispersion being up to 300%, by weight, based on the solids content, and containing up to 350%, by weight, of an abrasive material, based on the unstabilized pile article.

4,525,404

PILE ARTICLES WITH ATTENUATED UPPER PORTION AND A METHOD FOR PRODUCING THE SAME

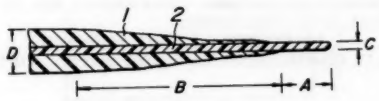
Masao Matsui, Takatsuki; Kazuo Okamoto, and Tutomu Naruse, both of Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers, Ltd., Osaka, both of, Japan

Filed Jul. 31, 1984, Ser. No. 636,200

Claims priority, application Japan, Aug. 12, 1983, 58-148612; Nov. 12, 1983, 58-212880

Int. Cl.³ A01N *1/00*

U.S. Cl. 428—92 **8 Claims**



1. A pile article which is a cloth-like fibrous structure provided with piles having a length of more than 10 mm, each pile composed of a non-attenuated portion where the fineness does not substantially vary in the length direction, an attenuated portion where the fineness is gradually reduced toward the top end and a fine top end, said piles comprising that

(a) the non-attenuated portion is composed of a core-sheath composite fiber having a flatness ratio of 1.5–5 and a fineness of 8–50d, and has 1–4 wing-shaped projections in cross-section,

(b) the top end is formed of an exposed core of the composite fiber and has a substantially uniform fineness of an average diameter of 5–25 μm and a length of 0.3–5 mm and

(c) the attenuated portion has a length of 1–15 mm.

4,525,405
POLYURETHANE BACKED CARPET CONTAINING A NON-CHLORINATED POLYMER

Linda M. McKinney, and Osborne K. McKinney, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1983, Ser. No. 566,612
Int. Cl.³ B32B *3/00, 3/26*
U.S. Cl. 428—95 **10 Claims**

3. A carpet backing formulation which comprises

(A) a polyol composition comprising

(1) at least one relatively high molecular weight polyether polyol having an average hydroxyl functionality from 2 to about 8, and an average hydroxyl equivalent weight of from about 500 to about 2200;

(2) at least one relatively low molecular weight polyol having an average hydroxyl functionality of from about 2 to about 8 and having an average hydroxyl equivalent weight of from about 31 to about 230;

(B) at least one polyisocyanate, polyisothiocyanate or mixture thereof;

(C) one or more catalysts;

(D) at least one nonchlorinated thermoplastic polymer having a density of from about 0.90 to about 1.3 g/cc; a melt index from about 0.0 to about 50 g/10 min, a flexural modulus of from about 5,000 to about 30,000 psi and an average particle size of from about 5 to about 150 microns, which polymer is prepared by polymerizing one or more ethylenically unsaturated monomers; and optionally

(E) one or more inorganic filler materials; and wherein

(i) components (A-1) and (A-2) are employed in quantities which provides a hydroxyl equivalent ratio of (A-1):(A-2) of from about 0.8:1 to about 5.5:1;

(ii) component (A) is present in a quantity of from about 25 to about 45 percent by weight based upon the combined weight of components (A), (D) and (E);

(iii) component (D) is present in quantities of from about 0.05 to about 25 percent by weight based upon the combined weight of components (A), (D) and (E);

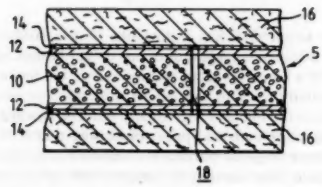
(iv) component (E) is employed in quantities of from zero to about 75 percent by weight of the combined weight of components (A), (D) and (E); and

(v) components (A) and (B) are present in quantities which provides an NCX:OH equivalent ratio of from about 0.95:1 to about 1.5:1 and X is oxygen or sulfur.

4,525,406
THERMAL INSULATION LAYER

James F. Pollock, Maidenhead, England, assignor to Secretary of State for United Kingdom Atomic Energy Authority, London, England

Filed Mar. 12, 1984, Ser. No. 588,725
Claims priority, application United Kingdom, Mar. 15, 1983, 8307167; Jul. 12, 1983, 8318861
Int. Cl.³ B32B *3/10, 3/12, 5/32, 15/00*
U.S. Cl. 428—137 **16 Claims**



1. A flexible thermal insulation layer comprising a substantially continuous sheet of permeable, conduction and convection inhibiting material, and including substantially continuous low thermal emissivity surfaces facing outwardly toward each side of the insulation layer, each outwardly-facing low thermal emissivity surface being vapour permeable and being covered by a layer of high voidage material.

6. A thermal insulation layer as claimed in claim 1 wherein the convection and conduction inhibiting structure comprises a cellular foam sheet, through which are defined a plurality of perforations.

4,525,407
ELASTIC COMPOSITES

Irving S. Ness, Palmetto Dunes, S.C., assignor to Chicopee, New Brunswick, N.J.

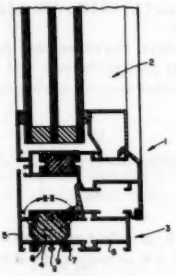
Continuation-in-part of Ser. No. 412,446, Aug. 27, 1982, abandoned. This application Jun. 8, 1983, Ser. No. 502,366
Int. Cl.³ B32B *3/24, 3/28*
U.S. Cl. 428—138 **16 Claims**

1. A selectively stretchable elastic composite comprising an elastic member in a relaxed condition intermittently bonded to an unstretched or non-gathered substrate less extensible than said elastic member, said composite being rendered elastic by stretching, and wherein the original length of the composite is not foreshortened when said composite is rendered elastic.

4,525,408
INSULATION OF ALUMINUM PROFILES IN A FIXTURE

Lars Johansson, Åseda, Sweden, assignor to Integral Profilsystem Ab, Åseda, Sweden

Filed Sep. 8, 1983, Ser. No. 530,426
Claims priority, application Sweden, Sep. 9, 1982, 8205119
Int. Cl.³ B32B *3/12, 7/04*
U.S. Cl. 428—159 **7 Claims**



1. An insulated composite profile having a predetermined outer dimension comprising:

(a) two profile portions having spaced first surfaces, the spacing between which defines said predetermined outer dimension of said composite profile, each profile portion being provided with a second surface and at least two longitudinally extending grooves on said second surface;

(b) two plastic strips of a hard plastic material having two edge portions, said edge portions engaging said grooves in order to interconnect said profile portions;

(c) said grooves having such a shape as to grip said edge portions with a clearance so that the edge portions cannot

escape from the grooves in a direction transverse to the length of the groove but can be inserted into said grooves from the end of each profile portion;

(d) said strips and said profile portions defining a longitudinally extending space;

(e) plastic foam filling said space; and

(f) the clearance between said edge portions and said grooves being at least partially filled with said plastic foam in order to maintain said spacing between said first surfaces of the profile portions as interconnected by said plastic strips and plastic foam and, thereby, maintain said predetermined outer dimension of the composite profile.

4,525,409

NYLON OR POLYESTER TREATED FABRIC FOR BEDDING

James N. Elesh, Evanston, Ill., assignor to Flexi-Mat Corporation, Chicago, Ill.

Filed Sep. 19, 1983, Ser. No. 533,293

Int. Cl.³ B05D *3/02*

U.S. Cl. 428—193 **16 Claims**

1. A process for making a fabric comprising the steps of:

(a) tightly weaving a cloth selected from the group consisting of nylon and polyester threads or a combination thereof;

(b) coating one surface with a fire retardant, water repellent urethane; and

(c) immersing the cloth in a fluid bath containing a bacteriostatic and fungistatic agent, a fire retardant, and a cationic anitstatic agent, said cationic antistat agent comprising a homogeneous, aqueous dispersion of organic cationic polymers, the solids content being about 21%, the weight of said cationic antistat agent being about 8.5 pounds per gallon, the viscosity of said cationic antistat agent being moderately viscous, and the pH of said cationic antistat agent ranging from about 6.0 to about 8.0 when present in water at a concentration of 10%.

4,525,410

PARTICLE-PACKED FIBER ARTICLE HAVING ANTIBACTERIAL PROPERTY

Zenji Hagiwara, Kusatsu; Hideo Ohki, Koshigaya; Shigetaka Hoshino, Sohka; Saburo Nohara, Nishinomiya; Shunya Ida, Nara, and Kenichi Tagawa, Osaka, all of Japan, assignors to Kanebo, Ltd. and Kanto Chemical Co., Inc., both of Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,980

Claims priority, application Japan, Aug. 24, 1982, 57-145549

Int. Cl.³ A61K *9/70, 33/34, 33/38;* **D06M** *11/04*

U.S. Cl. 428—198 **4 Claims**

1. A particle-packed fiber article having an anti-bacterial property comprising zeolitic particles retaining therein at least one metal ion having a bactericidal property and having a specific surface area of at least 150 m^2/g and a SiO_2/Al_2O_3 mol ratio of at most 14 and a mixed fiber assembly composed of a natural fiber staple or synthetic fiber staple and a fiber staple containing low-melting thermoplastic synthetic fibers having a melting point at least 30° C. lower than the melting point or the decomposition point of the aforesaid natural fiber staple or synthetic fiber staple, at least a part of the intersection points of the staple of said mixed fiber assembly being stuck to each other by the fusion of the low-melting thermoplastic synthetic fibers, whereby said zeolitic particles are incorporated and retained in the fiber assembly in the state of allowing the contact of the foregoing zeolitic particles with an external fluid.

4,525,411

CLEANING CLOTH

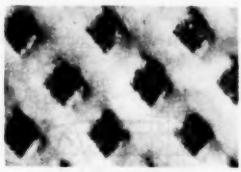
Klaus Schmidt, Kaiserslautern, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 302,572, Sep. 15, 1981, abandoned. This application Jul. 13, 1984, Ser. No. 630,348

Claims priority, application European Pat. Off., Sep. 15, 1980, 80105

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **16 Claims**



1. A cleaning cloth, which comprises: a fabric of intermingled fibers, said fibers being bonded to each other at a substantial number of interfiber junctions and at least some of said fibers being porous microfibers of a polymeric composition, each microfiber comprising a core of substantially nonporous polymer and a foamed polymer cover layer which surrounds said core, has a sheath-like configuration around said core, is coaxial with said core and contains open micropores, said micropores having a predominantly cylindrical shape, being substantially uniformly distributed within the sheath-like cover layer, encompassing from about 40 to 80% of the cross sectional area of each microfiber and the long axes of the pores being disposed parallel to the microfiber cross-sectional radius.

4,525,412

INFORMATION RECORDING MEDIUM

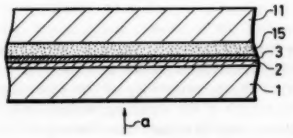
Yasuaki Nakane, Higashikana; Junichi Akamatsu, Kawagoe; Susumu Sakamoto, Matsudo, and Tadashi Kiyomiya, Ageo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,741

Claims priority, application Japan, Nov. 15, 1982, 57-200238

Int. Cl.³ B32B *15/04;* **G01D** *15/34*

U.S. Cl. 428—199 **6 Claims**



1. An information recording medium comprising:

a light-transmitting substrate,

a recording layer formed on said substrate, said recording layer having the characteristic of changing an optical characteristic when an incident recording light is converted to heat therein,

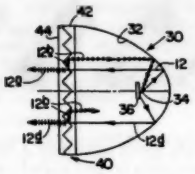
a protective layer having light-absorbing properties coated over said recording layer and arranged to absorb said recording light passing through said recording layer upon recording, and

a planar layer superimposed on said protective layer and capable of suppressing mechanical deformation of said recording layer.

4,525,413
OPTICAL DEVICE INCLUDING BIREFRINGENT POLYMER

Howard G. Rogers, Weston; Ruth C. Bilofsky, Lexington, both of Mass.; Russell A. Gaudiana, Merrimack, N.H., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 238,054, Mar. 2, 1981, Pat. No. 4,446,305.
This application Apr. 18, 1984, Ser. No. 601,579
Int. Cl.[3] B32B *9/04;* C08G *69/32;* G02B *5/30*
U.S. Cl. 428—212 20 Claims



1. A multilayer light-transmitting device comprising, in assembled bonded relation: a layer of transparent molecularly oriented highly birefringent polymer comprising repeating molecular units exhibiting high electron density substantially cylindrically distributed about the long axes of the polymer material and the repeating units thereof, said highly birefringent polymer exhibiting a birefringence in relation to the molecular configuration of said repeating molecular units and the cylindrical or ellipsoidal electron density distribution about said axes, said birefringence being in relation to said molecular configuration and said electron density distribution according to a diminsionless geometric index G represented by the relationship

$$G = 0.222 \times E \times \frac{L}{D}$$

wherein E is a dimensionless eccentricity factor defined by the relationship

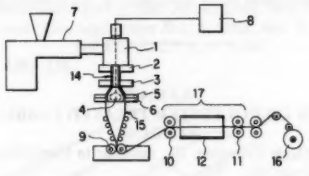
$$E = \frac{1 + e_L}{1 + e_T}$$

where e_L is the longitudinal eccentricity of the electron polarizability of the repeating molecular unit and e_T is the transverse eccentricity of the polarizability of the repeating molecular unit, L is the length of the repeating molecular unit along the main axis thereof and D is the mean diameter of the repeating molecular unit; said repeating molecular units of said birefringent polymer exhibiting a geometric index G of about 0.5 or higher; said multilayer light-transmitting device including at least one additional transparent layer having an index of refraction substantially matching one index of refraction of said layer of transparent molecularly oriented highly birefringent polymeric material and comprising isotropic or birefringent material; said at least one additional transparent layer, when a layer of birefringent material, having one index of refraction thereof substantially different from one index of refraction of said layer of transparent molecularly oriented highly birefringent polymer and having a molecular orientation substantially perpendicular to the molecular orientation of said molecularly oriented highly birefringent polymer.

4,525,414
HEAT-SHRINKABLE COMPOSITE LAMINATE FILM AND PROCESS FOR PREPARING THE SAME

Masaki Ohya; Yoshihiro Matsukura, and Mitsuru Anzai, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,702
Claims priority, application Japan, Oct. 29, 1982, 57-190539
Int. Cl.[3] B32B *7/02, 27/08*
U.S. Cl. 428—213 8 Claims

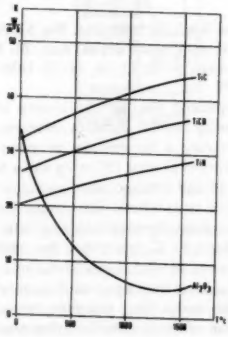


1. A heat-shrinkable composite laminate film comprising an intermediate layer having a thickness of from 3 to 30 μm and comprising a copolymer of from 65 to 95% by weight of vinylidene chloride and from 5 to 35% by weight of a comonomer copolymerizable with vinylidene chloride, an outer layer of an olefin resin having a thickness of from 5 to 50 μm, another outer layer of a polyamide having a thickness of from 5 to 50 μm and two adhesive layers respectively disposed between the intermediate layer and each of the two outer layers, each of the adhesive layers having a thickness of not less than 1 μm and below 5 μm and being at least one resinous material selected from the group consisting of a modified copolymer obtained by modifying a copolymer of ethylene and a vinyl carboxylate or an acrylic ester with an ethylenically unsaturated carboxylic acid or an acid anhydride thereof and a polymeric material obtained by further modifying said modified copolymer with a metal compound.

4,525,415
SINTERED HARD METAL PRODUCTS HAVING A MULTI-LAYER WEAR-RESISTANT COATING

Reuven Porat, Nahariya, Israel, assignor to Iscar Limited, North Nahariya, Israel

Filed Sep. 8, 1982, Ser. No. 415,784
Claims priority, application Israel, Sep. 11, 1981, 63802
Int. Cl.[3] B32B *7/02, 15/04*
U.S. Cl. 428—216 6 Claims



1. A sintered hard metal product consisting of a cemented metal carbide substrate and a thin wear-resistant surface coating comprising a plurality of coating layers of different compo-

sitions applied onto at least a part of the surface of said substrate and on top of eacch other by chemical vapour deposition, characterized in that said coating layers include:

an innermost layer applied directly onto said substrate and consisting of at least one member selected from nitrides and carbonitrides of Ti, Zr, Hf, V, Nb, Ta, Al and Si;

a second layer applied directly on said innermost layer, consisting essentially of aluminum oxide and having a thickness of about 1 to about 3μ;

a third layer composed of one or more sublayers of titanium carbide, titanium nitride and titanium carbonitride, applied on top of said aluminium oxide layer; and a further outermost layer consisting essentially of aluminium oxide and having a thickness of from about 0.4 to about 20 microns.

4,525,416

ADHESIVE TAPE

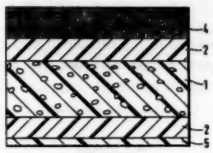
Peter Hammerschmidt, Wiesbaden, and Günther Crass, Taunusstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,165

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216603

Int. Cl.[3] **B32B** *5/30, 5/16, 27/32*

U.S. Cl. 428—220 **13 Claims**



1. A multilayer, biaxially oriented, delaminatable adhesive security tape, comprising:

an inner layer comprising a polymer or copolymer of an alpha-olefin having 2 to 6 carbon atoms, said layer including a plurality of solid particles having a dimension between about 0.2 and 20 microns in finely distributed form, in a quantity of from about 3 to 20% by weight with respect to the total weight of the polymer forming the inner layer, and a plurality of microcracks and small pores of vacuoles at the boundary zone between said alpha-olefin polymer or copolymer and said solid particles;

on both sides of said inner layer, a cover layer comprising a polymer or copolymer of an alpha-olefin having 2 to 4 carbon atoms;

an adhesive layer on the side of one of said cover layers facing away from the inner layer; and

an adhesive repellent layer on the other cover layer, again on its side facing away from the inner layer.

4,525,417

CARBON-CONTAINING SLIDING LAYER

Heinz Dimigen, and Hubertus Hübsch, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

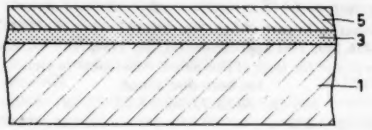
Filed Feb. 24, 1983, Ser. No. 469,363

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207096; Dec. 15, 1982, 3246361

Int. Cl.[3] **B32B** *15/04;* **C23C** *15/00*

U.S. Cl. 428—244 **12 Claims**

1. A workpiece comprising a substrate having a sliding surface provided with a friction-reducing coating; said coating consisting essentially of elemental carbon dispersed in a matrix formed of at least one metallic element in the proportions of 50.1 to 99.9 at % of the elemental carbon and 0.1 to 49.9 at % of the metallic element, the ratio of the metallic element to the



elemental carbon differing from the stoichiometric ratio of a carbide.

4,525,418

TWO-LAYERED PACKAGING MATERIAL FOR FOODSTUFFS ONE LAYER OF WHICH COMPRISES A POLYMER BLEND

Horst Dinklage, Dieburg; Herbert Fink, Bickenbach, and Hans-Peter Wolf, Ostercappeln, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Nov. 26, 1982, Ser. No. 444,723

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147519

Int. Cl.[3] **A22C** *13/00;* **A23G** *4/10;* **B32B** *27/12, 27/36*

U.S. Cl. 428—264 **7 Claims**

1. A two-layered packaging material for the direct contact packaging of food products, said material comprising cloth coated with a binary mixture of 50 to 100 parts by weight of a first acrylate emulsion polymer having a glass transition temperature, Tg_{max}, below 0° C. and up to 50 parts by weight of a second acrylate emulsion polymer having a glass transition temperature, Tg_{max}, above 30° C., said first acrylate emulsion polymer comprising

(a) at least 90 weight percent, based on the total first polymer, of a lipophilic monomer component comprising at least one member selected from the group consisting of esters of acrylic acid and of methacylic acid with a lower alkanol, and from 0 to 10 weight percent, based on said lipophilic monomer, of at least one further comonomer, the methyl methacrylate content of the first polymer not exceeding 40 weight percent of the total first polymer;

(b) a hydrophilic monomer component having acidic properties, in an amount from 0 to 5 weight percent, based on the total first polymer; and

(c) a crosslinking monomer component in an amount from 0 to 7 weight percent, based on the total first polymer;

and said second emulsion polymer comprising

(a) at least 95 weight percent, based on this total second polymer, of a lipophilic monomer component comprising more than 60 weight percent, based on this total lipophilic component, of methyl methacrylate, and of less than 40 weight percent, based on this lipophilic component, of at least one further member selected form the group consisting of esters of acrylic acid and/or of methacrylic acid with a lower alkanol, and of from 0 to 10 weight percent, based on this lipophilic component, of a further monomer; and

(b) of less than 5 weight percent of a hydrophilic monomer component having acidic properties.

4,525,419

COPOLYESTER PRIMED PLASTIC FILM

Robert G. Posey, Taylors, and Edwin C. Culbertson, Greer, both of S.C., assignors to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 495,192, May 16, 1983, Pat. No. 4,476,189. This application Jul. 26, 1984, Ser. No. 634,514

The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.[3] **B32B** *15/00, 27/06, 27/10*

U.S. Cl. 428—336 **14 Claims**

1. An oriented self-supporting plastic film having a continuous copolyester primer coating on one or both sides thereof, said self supporting plastic film is selected from the group consisting of biaxially oriented polyethylene, polypropylene and nylon, said plastic film prepared by melt extruding a substantially amorphous plastic film and thereafter orienting the film by stretching in one or two directions and heat setting the film, said copolyester primer coating being applied to said film as an aqueous dispersion prior to stretching in one direction or subsequent to stretching in one direction but prior to stretching in a mutually perpendicular direction, said copolyester primer coating consisting essentially of the polyester condensation product of the following monomers or their polyester forming equivalents:

(A) About 60 to 75 mole percent of terephthalic acid;

(B) About 15 to 25 mole percent of at least one aliphatic dicarboxylic acid of the formula $HOOC(CH_2)_nCOOH$, wherein n ranges from about 1–11;

(C) Greater than from about 6 up to about 15 mole percent of at least one sulfomonomer containing an alkali metal sulfonate group attached to a dicarboxylic aromatic nucleus, and

(D) stoichiometric quantities, of about 100 mole percent of at least one copolymerizable aliphatic or cycloaliphatic alkylene glycol having from about from 2 to 11 carbon atoms.

4,525,420

POLYURETHANE ELASTIC YARNS AND THEIR PRODUCTION

Fusao Imai, and Norio Okumura, both of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Sep. 22, 1983, Ser. No. 535,443

Claims priority, application Japan, Sep. 22, 1982, 57-165469

Int. Cl.[3] **D02G** *3/00*

U.S. Cl. 428—372 **7 Claims**

1. A polyurethane elastic yarn containing in the polyurethane composition thereof an inorganic filler chosen from carbonates and sulfates of alkaline earth metals belonging to Group II a of the periodic table, said filler comprising from 0.2 to 10% by weight based on the weight of the elastic yarn and having a refractive index ($n_D^{20^\circ C.}$) of not more than 1.75.

4,525,421

SURFACE HARD COAT FOR A SYNTHETIC RESIN LENS

Satoshi Kubota; Mikito Nakashima; Takao Mogami, and Tetsuo Nakagawa, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,890

Claims priority, application Japan, Jun. 14, 1983, 58-106092

Int. Cl.[3] **B32B** *27/36*

U.S. Cl. 428—412 **11 Claims**

1. A synthetic resin lens surface hard coating composition, comprising:

about 50–800 parts by weight of at least one organic silicon compound represented by the general formula:

$$R^1-Si-(OR^3)_{3-l}$$
(with R_f^2 on the Si)

wherein R^1 is a hydrocarbon having from one to six carbon atoms, or an organic group containing a vinyl, methacryloyloxy or an epoxy radical, R^2 is a hydrocarbon group having from one to four carbon atoms, R^3 is a hydrocarbon group or an alkoxy alkyl group having from one to five carbon atoms, or a hydrogen atom, and l is 0 or 1;

100 parts by weight of colloidal silica (based on solid SiO_2), said silica having a particle size diameter of from about 1 to 100 millimicrons;

about 50–600 percent by weight of at least one polyfunctional epoxy compound; and

about 0.01 to 5.0 percent by weight magnesium perchlorate based on the residual solids in the composition after curing.

4,525,422

ADHESION PRIMERS FOR ENCAPSULATING EPOXIES

Sheldon H. Butt, Godfrey, Ill.; Edward F. Smith, III, Madison, and F. Dennis Gyurina, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 22, 1982, Ser. No. 443,793

Int. Cl.[3] **B32B** *15/08*

U.S. Cl. 428—418 **6 Claims**

1. A metal plastic composite having improved bond strength, said metal being selected from the group consisting essentially of copper and copper alloys;

an adhesion primer on the surface of the copper or copper alloy, said adhesion primer comprising a glass-like, substantially pore-free phosphate coating; and

the plastic of said composite comprising an epoxy resin adhesively bonded to the surface of said copper or copper alloy having said adhesion primer, said epoxy containing a mold release agent.

4,525,423

FLUOROCHEMICAL COPOLYMERS AND OVENABLE PAPERBOARD AND TEXTILE FIBERS TREATED THEREWITH

Michael M. Lynn, White Bear Lake, and Richard D. Howells, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1982, Ser. No. 433,973

Int. Cl.[3] **B32B** *29/04, 27/30*

U.S. Cl. 428—421 **3 Claims**

1. Paperboard, having incorporated thereon sufficient fluorochemical copolymer to render said paperboard ovenable, said copolymer comprising (by weight) about:

(a) 60 to 80% of polymer chain repeat units derived from fluoroacrylate monomer of the formula:

$$(R_f)_pQOCOCH{=}CH_2$$

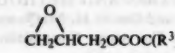
wherein R_f is a fluoroaliphatic radical-containing group having 3 to 20 carbon atoms, Q is a polyvalent organic connecting group, and p is 1 or 2;

(b) 1 to 30% of polymer chain repeat units derived from halogenated alkyl or alkoxyalkyl acrylate monomer of the formula:

$$R^1O(R^2O)_n[C(O)CH_2O]_mCOCH{=}CH_2$$

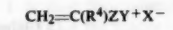
wherein R^1 is a C_{1-20} alkyl, cycloalkyl, haloalkyl, or halocycloalkyl group, R^2 is a C_{1-6} alkylene or haloalkylene group, each R^2 group can be the same as or different from other R^2 groups, at least one R^1 or R^2 group contains a halogen atom, n is zero to about 10 with the proviso that when n is zero R^1 is a C_{1-16} haloalkyl or halocycloalkyl group, and m is zero or 1;

(c) 1 to 15% of polymer chain repeat units derived from monomer of the formula:



wherein R^3 is H or methyl;

(d) 1 to 6% of polymer chain repeat units derived from cationic monomer of the formula:



wherein R^4 is H or methyl, Z is a divalent electron-withdrawing group which activates free-radical polymerization, Y^+ is a monovalent cationogenic group, and X^- is a water solubilizing anion; and

(e) 0 to 20% of polymer chain repeat units derived from vinylidene chloride;

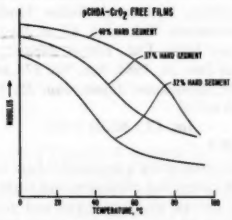
with the proviso that the weight percent of carbon-bonded fluorine in said copolymer is at least about 15%.

4,525,424

FLEXIBLE MAGNETIC RECORDING MEDIA HAVING A POLYESTER-POLYURETHANE BINDER AND CHROMIUM DIOXIDE PIGMENT

Richard L. Bradshaw, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,291
Int. Cl.[3] G11B *5/70;* **B32B** *27/40*
U.S. Cl. 428—425.9 **10 Claims**



1. A flexible magnetic recording media, comprising; a flexible substrate, and a ferromagnetic chromium dioxide pigment-loaded-binder adhesively coating said substrate; the improvement comprising said binder being a thermoplastic polyurethane formed as a reaction product of:

(A) a hydroxyl-terminated polyester which itself is a reaction product of a difunctional alcohol (diol) having hydrolytic stability, and a dicarboxylic acid selected from the group consisting of adipic acid, azelaic acid and 1,12-dodecanedioic acid, or mixtures thereof, said polyester having a hydroxyl number of about 50 to 250;

(B) a chain extender comprising a primary or a secondary alcohol selected from the group consisting of 1,4-butanediol, 1,3-butanediol, 1,5-pentanediol, 1,6-hexanediol and 2,5-hexanediol, the resultant hydroxyl number of said polyester and chain extender being about 130 to 300; and

(C) an aromatic diisocyanate;

wherein the relative proportions of (A), (B) and (C) are selected to produce a pigment-loaded polyurethane having a hard segment content in the range of about 37 to 40 percent by weight, and a soft segment molecular weight (M_n) in the range of about 500 to 1500, wherein the pigment loading is in the range 80 to 88% by weight.

4,525,425

WATER AND OIL REPELLENT METAL OXIDE-ORGANIC COMBINATION COATING SYSTEMS AND METHOD OF MAKING SAME

Peter K. Church, Cascade, Colo., assignor to El-Chem Corporation, Cascade, Colo.

Filed May 11, 1981, Ser. No. 262,778
Int. Cl.[3] B32B *9/00*
U.S. Cl. 428—428 **43 Claims**

1. A method of forming a water and oil repellent combination coating on a substrate selected from the group consisting of glass, tile, ceramic, porcelain, metals and metal oxides, paints, enamels and organic materials containing sizable amounts of inorganics on or in the surface which comprises the steps of:

applying a liquid based suspension of a hydrated oxide and/or hydroxide of a metal selected from the group consisting of zirconium, aluminum, iron, chromium, tin, titanium, nickel, cobalt, cerium, and mixtures thereof to the surface of the substrate by rubbing the suspension uniformly over the surface while permitting the liquid base to evaporate until the surface is dry or nearly dry and a coating of the oxide is deposited on the substrate surface; and,

treating the oxide and/or hydroxide coating with a combining compound selected from the group consisting of an organic compound, a silicone compound and a fluorocarbon compound and mixtures thereof which combines therewith to form a water and oil repellent and abrasion resistant combined coating on the substrate.

15. A water and oil repellent combination coating on a substrate selected from the group consisting of glass, tile, ceramic, porcelain, metals and metal oxides, paints, enamels and organic materials containing sizable amounts of inorganics on or in the surface which comprises a first layer adhered to the substrate by rubbing until at least nearly dry a hydrated oxide and/or hydroxide of a metal selected from the group consisting of zirconium, aluminum, iron, chromium, tin, titanium, nickel, cobalt, cerium and mixtures thereof and a second layer combined with the first layer comprising an organic compound selected from the group consisting of:

(1) stearic acid
(2) palmitic acid
(3) myristic acid
(4) oleic acid
(5) linoleic acid
(6) linolenic acid
(7) methyl stearate
(8) potassium stearate
(9) sodium stearate
(10) ammonium stearate
(11) triethanolamine stearate
(12) potassium palmitate
(13) sodium palmitate
(14) ammonium palmitate
(15) triethanolamine palmitate
(16) potassium myristate
(17) sodium myristate
(18) ammonium myristate
(19) triethanolamine myristate
(20) potassium oleate
(21) sodium oleate
(22) ammonium oleate
(23) triethanolamine oleate
(24) naptha
(25) n-hexadecane
(26) cetyl alcohol
(27) lanolin
(28) acetone
(29) methyl ethyl ketone
(30) methanol
(31) isopropanol
(32) 2-propanol
(33) 1-pentanol
(34) 1,6-hexanediol

(35) hexyl alcohol
(36) heptal alcohol
(37) 1,1,1-trichloroethane
(38) tetrachloroethylene
(39) methyl chloride
(40) methylene chloride
(41) carbon tetrachloride
(42) mineral spirits
(43) mineral oil
(44) paraffin
(45) Stoddard solvent
(46) lanolin
(47) polydimethylsiloxane
(48) dimethylsilicone wax
(49) methylalkylpolysiloxane
(50) chlorophenylmethylsiloxane
(51) fluorodimethylsiloxane
(52) fluorocarbon
(53) hydroxy terminated (SiOH) dimethyl reactive silicone and mixtures thereof.

4,525,426

ULTRAVIOLET LIGHT ABSORBING AGENTS, METHOD FOR MAKING, COMPOSITIONS, AND ARTICLES CONTAINING SAME

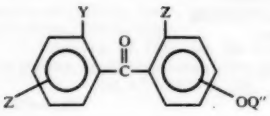
Blair T. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 373,361, Apr. 30, 1982, Pat. No. 4,495,360. This application Oct. 9, 1984, Ser. No. 659,053
Int. Cl.[3] B32B *9/04*
U.S. Cl. 428—447 **6 Claims**

1. An aqueous coating comprising,

(a) a dispersion of a colloidal silica in a solution of the partial condensate of a silanol having the formula, $R^2Si(OH)_3$, where R^2 is selected from the group consisting of alkyl having 1 to 13 carbon atoms and aryl having 6 to 13 carbon atoms, at least 70 weight percent of which is $CH_3Si(OH)_3$, in a mixture of an aliphatic alcohol and water, said dispersion containing from 10 to 50 percent by weight of solids, said solids consisting essentially of 10 to 70 percent by weight of the colloidal silica and 30 to 90 percent by weight of the partial condensate, and

(b) an effective amount of an ultraviolet light absorbing agent comprising a compound having the formula,



where Q'' is

$$-CH_2(CH_2)_nSi(OCH_3)_{3-a}(OR)_a,$$

R is alkyl or alkanoyl having 2 to 6 carbon atoms, Y is H or OH, Z is H, OH, OQ'' or OW, where at least one Z is OH in the ortho position to the carbonyl if Y is H, W is C_mH_{2m+1}, m is 1 to 18, n=0, 1 or 2, and "a" has a value of from about 0.5 to about 2.5 inclusive.

4,525,427

POLYESTER PRIMER COMPOSITION AND METHOD

Charles E. Bayha, Collierville, Tenn., and Daniel H. McQueen, Holly Springs, Miss., assignors to The Alpha Corporation, Collierville, Tenn.

Continuation of Ser. No. 420,101, Sep. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 379,887, May 19, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 659,867
Int. Cl.[3] B32B *15/08*
U.S. Cl. 428—458 **13 Claims**

10. A dented or gouged surface, adhered to which is a primer composition comprising a polyester containing dicyclopentadiene moieties in the polymer backbone formed by a two-stage process, the first stage comprising heating maleic acid and dicyclopentadiene together under inert conditions, to an elevated temperature which, under the conditions of the process, is less than both (1) the temperature at which maleic acid will isomerize to fumaric acid, and (2) the temperature at which dicyclopentadiene will crack to form cyclopentadiene, until an interemdiate is formed, which intermediate is the reaction product of maleic acid and dicyclopentadiene and which intermediate contains maleic acid moieties and dicyclopentadiene moieties in a mole ratio which is about 1; and the second stage comprising heating said intermediate in the presence of a compound containing at least one alcoholic hydroxy group to temperatures up to 240° C. to produce said polymer, wherein the intermediate, as subjected to heating in the second stage, contains less than 2% unreacted dicyclopentadiene, and said polyester comprising about 90% to about 50% by weight of said composition and a diluent comprising from about 10% to about 50% by weight of said composition.

4,525,428

PROCESS FOR PRODUCING MULTICOLOR HEAT-TRANSFER RECORDING PAPER

Toshihiko Matsushita, Funabashi; Sadao Morishita, Ibaraki, and Hideo Makishima, Takasago, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,349
Claims priority, application Japan, Jan. 25, 1983, 58-10758; Jan. 25, 1983, 58-10759
Int. Cl.[3] B32B *9/06*
U.S. Cl. 428—488.1 **10 Claims**

1. A process for producing a multicolor heat transfer recording paper, which comprises emulsionizing three hot-melt inks of three primary colors, magenta, cyan and yellow, said inks differing by at least 10° C. in melting point from each other, mixing and dispersing the emulsions, then coating the dispersion on a support and drying the coating.

9. A multicolor heat transfer recording paper produced by the process of claim 1.

4,525,429

POROUS SEMICONDUCTOR DOPANT CARRIERS

Gregory A. Kaiser, Lewiston; Gabriel P. DeMunda, Niagara Falls, both of N.Y., and Richard E. Tressler, Julian, Pa., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jun. 8, 1983, Ser. No. 502,287
Int. Cl.[3] H01F *3/02*
U.S. Cl. 428—566 **4 Claims**

1. A dopant source for the vapor phase transport of dopant at elevated temperatures in the form of a sintered carrier member having a wafer configuration comprising at least 90 percent of silicon carbide, said sintered member being a solid, porous structure having a porosity of at least about 20 percent with an average pore size in the range from about 5 microns to about 250 microns, the pores thereof being impregnated with a dopant containing an element selected from the group consisting of phosphorus, arsenic, antimony, boron, gallium, aluminum, zinc, silicon, tellurium, tin and cadmium.

4,525,430

STEEL FIBRE REINFORCED RUBBER ARTICLE

Luc Bourgois, Kwadestraat 7, B-8748 Waregem (Desselgem), Belgium

Filed Feb. 6, 1984, Ser. No. 577,516

Claims priority, application United Kingdom, Feb. 25, 1983, 8305229

Int. Cl.³ B32B *15/06, 15/00*

U.S. Cl. 428—625 7 Claims

1. A steel fibre reinforced rubber article, characterized by the fact that the rubber that is in contact with the fibre has a specific electrical resistance of at least B 5×10^7 Ohm centimeter.

4,525,431

IRON-BASED ALLOYS FOR WELDED STRUCTURAL ELEMENTS, METHOD OF MANUFACTURING SUCH ELEMENTS AND STRUCTURES BUILT THEREFROM

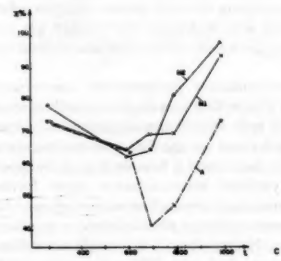
Francois Duffaut, Nevers, France, assignor to Imphy S.A., Paris, France

Filed Nov. 30, 1982, Ser. No. 445,636

Claims priority, application France, Dec. 4, 1981, 81 22756

Int. Cl.³ B22B *15/18*

U.S. Cl. 428—638 3 Claims



1. A manufactured structural element for use under cryogenic conditions and containing at least one welded joint wherein said structural element and said welded joint each comprises an alloy consisting essentially by weight of about 35 to about 39 percent nickel, up to 20 percent cobalt, up to 0.25 percent silicon, up to 0.04 percent carbon, up to 0.004 percent sulfur, up to 0.008 percent phosphorous, about 0.2 to about 1.5 percent manganese, about 0.2 to about 0.5 percent titanium, and the balance iron and impurities.

4,525,432

MAGNETIC MATERIAL WIRE

Takashi Saito, Yokohama; Kazumoto Suzuki, Tokyo, and Yoshihiro Naganuma, Funabashi, all of Japan, assignors to Fujikura Ltd., Japan

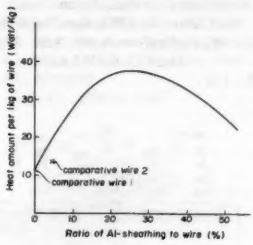
Filed Jun. 20, 1983, Ser. No. 506,013

Claims priority, application Japan, Jun. 21, 1982, 57-105499; Jun. 21, 1982, 57-105500

Int. Cl.³ C23C *1/08*

U.S. Cl. 428—653 4 Claims

1. A magnetic material wire for winding around an electric conductor comprising a core of magnetic material having a Curie point of 70° to 250° C., and a high conductive metal sheathing of a uniform thickness covering the core, the ratio of the metal sheathing to the wire in cross-sectional area being in the range of 15 to 40%, which said core containing apart from



impurities 32 to 52% by weight of nickel, 0.5 to 9% by weight of chromium, 0.2 to 2% by weight of silicon and balance iron.

4,525,433

COMPOSITE MATERIAL

Alan E. Heywood, St. Albans, England, assignor to Johnson Matthey Public Limited Company, Great Britain

Filed Sep. 8, 1982, Ser. No. 416,067

Claims priority, application United Kingdom, Sep. 8, 1981, 8127071; Nov. 12, 1981, 8134130

Int. Cl.³ C22C *1/02, 5/00, 9/00, 39/00*

U.S. Cl. 428—670 15 Claims

1. A composite material comprising two outer layers comprising a platinum group metal or alloy thereof and an inner layer disposed between and bonded to the outer layers, at least one of the outer layers comprising a member selected from the group consisting of a dispersion strengthened platinum group metal and a dispersion strengthened alloy containing a major proportion of a platinum group metal, and the inner layer comprising a noble metal or noble metal alloy which is dissimilar to the metal or alloy of the said outer layers, said inner layer comprising a member selected from the group consisting of metallic palladium, dispersion strengthened palladium, a palladium alloy and a dispersion strengthened palladium alloy.

4,525,434

COPPER ALLOY HAVING HIGH RESISTANCE TO OXIDATION FOR USE IN LEADS ON SEMICONDUCTOR DEVICES AND CLAD MATERIAL CONTAINING SAID ALLOY

Masaki Morikawa, Iwatsuki; Hideaki Yoshida, Kasukabe, and Kunio Kishida, Ohmiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Sep. 6, 1983, Ser. No. 529,593

Claims priority, application Japan, Oct. 19, 1982, 57-183554

Int. Cl.³ C23C *5/00*

U.S. Cl. 428—674 2 Claims

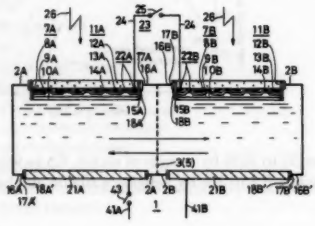
1. A Cu alloy clad material for use in leads on semiconductor devices comprising a substrate wholly or partially covered by a clad metal, wherein the substrate is a Cu or Cu alloy having high electrical conductivity and good heat dissipation, and the clad metal is a Cu alloy having high resistance to oxidation which consists essentially of 7–15% Mn, 10–30% Zn, 0.2–10% Ni, 0.1–3% Al, the percentage being by weight, with the balance being Cu and incidental impurities.

4,525,435

LIGHT ENERGY CONVERSION SYSTEM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Mar. 28, 1983, Ser. No. 479,559
Claims priority, application Japan, Mar. 29, 1982, 57-50533
Int. Cl.[3] H01M 6/36
U.S. Cl. 429—111 13 Claims



1. A light energy conversion system comprising;

a redox reaction chamber provided with first and second cells intercommunicating through an ion bridge and containing first and second electrolytic solutions, respectively;

a first semiconductor photoelectric conversion structure having a P type first non-single crystalline semiconductor layer, an I type second non-single crystalline semiconductor layer formed on the first non-single crystalline semiconductor layer, and a heavily doped, N type third non-single crystalline semiconductor layer formed on the second non-single crystalline semiconductor layer;

a second semiconductor photoelectric conversion structure having an N type fourth non-single-crystalline semiconductor layer, an I type fifth non-single crystalline semiconductor layer formed on the fifth non-single-crystalline semiconductor layer, and a heavily doped, P type sixth non-single-crystalline semiconductor layer formed on the fifth non-single-crystalline semiconductor layer;

a first electrode in contact with the first electrolytic solution contained in the first cell of the redox rcaction chamber;

a second electrode in contact with the second electrolytic solution contained in the second cell of thc redox reaction chamber and paired with the first electrode;

a third electrode connected with the first non-single-crystalline semiconductor layer of the first semiconductor photoelectric conversion structure;

a fourth electrode connected with the fourth non-single-crystalline semiconductor layer of the second semiconductor photoelectric conversion structure and paired with the third electrode;

means for electrically enterconnecting the third and fourth electrodes; and

means for connecting a load across the first and second electrodes to supply electric power to the load;

wherein the first semiconductor photoelectric conversion structure is provided in the first cell (a) so that it forms a part of the first cell wall, (b) so that light is incident on the first semiconductor photoelectric conversion structure directly without passing through the first electrolytic solution in the first cell, and (c) so that only the portion of the semiconductor photoelectric conversion structure on the side of the third non-single-crystalline semiconductor layer is held in contact with the first electrolytic solution; and

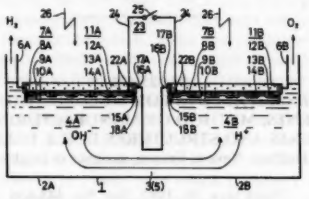
wherein the second semiconductor photoelectric conversion structure is provided in the second cell (a) so that it forms a part of the second cell wall, (b) so that light is incident on the second semiconductor photoelectric conversion structure directly without passing through the second electrolytic solution in the second cell, and (c) so that only the portion of the semiconductor photoelectric conversion structure on the side of the sixth non-single-crystalline semiconductor layer is held in contact with the second electrolytic solution.

4,525,436

LIGHT ENERGY CONVERSION SYSTEM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,560
Claims priority, application Japan, Mar. 29, 1982, 57-50533
Int. Cl.[3] H01M 6/36
U.S. Cl. 429—111 10 Claims



1. A light energy conversion system comprising:

a redox reaction chamber provided with first and second cells in intercommunication through a bridge and respectively containing first and second aqueous solutions of the same kind, and hydrogen and oxygen gas outlet means extending outwardly of the first and second cells, respectively;

a first semiconductor photoelectric conversion structure having a P type first non-single-crystalline semiconductor layer, an I type second non-single-crystalline semiconductor layer formed on the first non-single-crystalline semiconductor layer, and a heavily doped, N type third non-single-crystalline semiconductor layer formed on the second non-single-crystalline semiconductor layer;

a second semiconductor photoelectric conversion structure having an N type fourth non-single-crystalline semiconductor layer, an I type fifth non-single-crystalline semiconductor layer formed on the fourth non-single-crystalline semiconductor layer, and a heavily doped, P type sixth non-single-crystalline semiconductor layer formed on the fifth non-single-crystalline semiconductor layer;

a first electrode connected to the first non-single-crystalline semiconductor layer of the first semiconductor photoelectric conversion structure;

a second electrode connected to the fourth non-single-crystalline semiconductor layer of the second semiconductor photoelectric conversion structure and paired with the first electrode; and

means for electrically interconnecting the first and second electrodes;

wherein the first semiconductor photoelectric conversion structure is provided in the first cell (a) so that it forms a part of the first cell wall, (b) so that light is incident on the first semiconductor photoelectric conversion structure directly without passing through the first aqueous solution in the first cell, and (c) so that only the portion of the semiconductor photoelectric conversion structure on the side of the third non-single-crystalline semiconductor layer is held in contact with the first aqueous solution; and

wherein the second semiconductor photoelectric conversion structure is provided in the second cell (a) so that it forms a part of the second cell wall, (b) so that light is incident on the second semiconductor photoelectric conversion structure directly without passing through the second aqueous solution in the second cell, and (c) so that the portion of the semiconductor photoelectric conversion structure on the side of the sixth non-single-crystalline

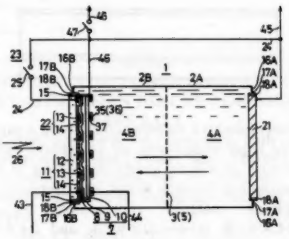
semiconductor layer is held in contact with the second aqueous solution.

4,525,437

LIGHT ENERGY CONVERSION SYSTEM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Mar. 28, 1983, Ser. No. 479,561
Claims priority, application Japan, Mar. 29, 1982, 57-50534
Int. Cl.³ H01M 6/36
U.S. Cl. 429—111 **11 Claims**



1. A light energy conversion system comprising;

a redox reaction chamber provided with first and second cells intercommunicating through an ion bridge and respectively containing first and second electrolytic solutions;

a semiconductor photoelectric conversion structure having a first non-single crystalline semiconductor layer of a P or N first conductivity type, an I type non-single-crystalline semiconductor layer formed on the first non-single-crystalline semiconductor layer, and a heavily doped, third non-single crystalline semiconductor layer of a second conductivity type opposite that of the first conductivity type of the first non-single-crystalline semiconductor layer formed on the second non-single-crystalline semiconductor layer;

a first electrode in contact with the first electrolytic solution contained in the first cell of the redox reaction chamber;

a second electrode connected to the first non-single crystalline semiconductor layer of the semiconductor photoelectric conversion structure and forming a first electrode pair with the first electrode;

a third electrode at least partly covering the third non-single crystalline semiconductor layer of the semiconductor photoelectric conversion structure and forming a second electrode pair with the first electrode; and

means for electrically interconnecting the first and second electrodes; and

means for connecting a load between the second electrode pair to supply electric power to the load; and

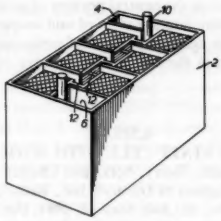
wherein the semiconductor photoelectric conversion structure is provided in the second cell of the redox chamber (a) so that it forms a part of the cell wall, (b) so that light is incident on the semiconductor photoelectric conversion structure directly without passing through the second electrolytic solution in the second cell, and (c) so that only the third non-single-crystalline semiconductor layer of the semiconductor photoelectric conversion structure is held in contact with the second electrolytic solution.

4,525,438

RECOMBINATION MULTICELL ELECTRIC STORAGE BATTERY

Ernest J. Pearson, Manchester, England, assignor to Chloride Group Public Limited Company, London, England

Filed Oct. 31, 1983, Ser. No. 547,226
Claims priority, application United Kingdom, Oct. 29, 1982, 8230957; Jul. 14, 1983, 8319050
Int. Cl.³ H01M 6/42
U.S. Cl. 429—149 **8 Claims**



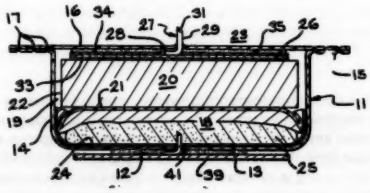
1. An electric storage battery comprising a plurality of cells, including two electrical end cells, electrically connected in series, each cell comprising a stack of alternating positive and negative battery plates interleaved with separator material, said separator material being capable of absorbing electrolyte in an amount sufficient to provide an electrical connection between adjacent plates of opposite polarity in the stacks, the battery containing substantially no mobile electrolyte, and each plate, with the exception of every alternate plate in the two electrical end cells, being electrically connected to a substantially coplanar plate of opposite polarity in an adjacent cell by an integral bridge piece, the bridge pieces together constituting intercell connectors, and every alternate plate in the two electrical end cells being connected to a battery terminal, each cell having at least one surface which is adjacent and opposed to a respective surface of a further cell, each pair of cells which is directly connected by an intercell connector being spaced apart and maintained in spaced relationship by only the said intercell connector and each pair of opposed surfaces of a pair of adjacent cells which is not directly connected by an intercell connector being associated with restraining means which prevent relative movement of those cells resulting in contact of the said opposed surfaces.

4,525,439

CONNECTOR APERTURE SEAL FOR A GALVANIC CELL

Robert D. Simonton, 1900 Hampton Rd., Fremont, Ohio 43420

Filed Oct. 7, 1983, Ser. No. 540,022
Int. Cl.³ H01M 6/12, 6/46
U.S. Cl. 429—162 **9 Claims**



1. An element of a flat alkaline cell comprising a plastic sheet for a cell envelope wall, a metal collector plate having its major surfaces coextensive with the flat dimensions of said cell, a metallic connector, a fused metallic bond between said plate

and said connector on a central portion of a first major surface of said plate, a coating of a material which is adherent to the metal of said plate and is resistant to attack by potassium hydroxide on said first major surface of said plate coextensive with said first major surface, and a layer of hot melt adhesive on said coating, coextensive with and bonded to said coating on said first major surface of said plate over essentially the entire surface surrounding said connector bond, and bonded to said plastic sheet over an area essentially coextensive and in registry with said first major surface of said plate, said sheet having a passage for said connector and said connector passing through said sheet at the central portion of said plate whereby essentially the entire lateral extent of said coating and adhesive on said plate seals against the flow of potassium hydroxide to be contained within the cell to said passage in said envelope sheet.

4,525,440

SOLID STATE CELL WITH ANOLYTE

Luverne H. Barnette, Derry, N.H., and Charles C. Liang, Clarence, N.Y., assignors to Duracell Inc., Bethel, Conn.

Division of Ser. No. 262,890, May 13, 1981, Pat. No. 4,390,446.
This application Sep. 30, 1982, Ser. No. 431,881
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **11 Claims**

1. A solid state cell comprising a solid cathode, a solid electrolyte and a solid anolyte characterized in that said anolyte is comprised of a solid active metal anode material admixed with a cationic conductor and wherein said cationic conductor comprises at least 50% by volume of said anolyte.

4,525,441

MULTICOLOR ELECTROPHOTOGRAPHIC PROCESS USING TiO_2

Kei Takahata, Moriyama; Sadao Murasawa, Itami; Hiroshi Ichida, Shiga; Mizuho Okada, and Takao Nakayama, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Nov. 19, 1982, Ser. No. 442,973
Claims priority, application Japan, Nov. 27, 1981, 56-190168
Int. Cl.³ G03G *13/01*
U.S. Cl. 430—46 **16 Claims**

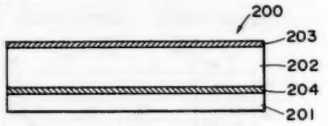
1. An electrophotographic process, characterized by forming a multiple color image by successively carrying out the first color image-reproducing process which comprises exposing, to an optical image, an electrophotographic photosensitive material having a photoconductive, sensitive layer consisting essentially of titanium dioxide and a binder on an electroconductive substrate, then carrying out a positive corona charging to form a positive electrostatic latent image and thereafter carrying out developing to form a toner image, and the second and following color image-reproducing processes which comprise successively carrying out negative corona charging, AC corona charging or both of them, exposure to an optical image, positive corona charging and development to form a toner image.

4,525,442

PHOTOCONDUCTIVE MEMBER CONTAINING AN AMORPHOUS BORON LAYER

Shigeru Shirai, Yamato; Junichiro Kanbe, and Tadaji Fukuda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 334,572, Dec. 28, 1981, abandoned.
This application Jul. 16, 1984, Ser. No. 631,006
Claims priority, application Japan, Jan. 9, 1981, 56-2275; Jan. 10, 1981, 56-2244; Jan. 10, 1981, 56-2245; Jan. 13, 1981, 56-3592; Jan. 13, 1981, 56-3593; Jan. 13, 1981, 56-3594
Int. Cl.³ G03G *5/082*
U.S. Cl. 430—57 **14 Claims**



1. A photoconductive member comprising a support, a photoconductive layer comprising an amorphous material comprising a matrix of silicon atoms containing at least one of hydrogen atoms and halogen atoms, a barrier layer comprising an amorphous material represented by $a—[Si_\gamma(C,N,O)_{1-\gamma}](H,X)_{1-\delta}$, where $0<\gamma<1$, and $0<\delta<1$ existing between said support and said photoconductive layer having the function to substantially prevent injection of charges from the side of said support into said photoconductive layer, and a layer provided on the upper surface of said photoconductive layer and comprising an amorphous material containing boron, wherein the amorphous material containing boron is a member selected from the group consisting of the amorphous materials (1) and (2) wherein $B_\gamma X_{1-\gamma}(0<\gamma<1)$ is (1) and $B(H_\beta X_{1-\beta})_{1-\alpha}(0<\alpha,\beta<1)$ is (2); and wherein B is boron atom, H is hydrogen atom and X is halogen atom.

4,525,443

NOVEL 3-TRIHALOCHALCOGENPROPENONE COMPOUNDS

Michael R. Detty, and Jerome H. Perlstein, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,807
Int. Cl.³ G03G *5/09*
U.S. Cl. 430—83 **12 Claims**

1. A Z-3-trihalochalcogenpropenone selected from the group consisting of Z-3-trihaloseleniumpropenone and Z-3-trihalotelluriumpropenone.

4,525,444

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Karl-Friedrich Doessel, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,388
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210577
Int. Cl.³ G03G *5/05*
U.S. Cl. 430—96 **9 Claims**

1. An electrophotographic recording material for preparing a printing form or a printed circuit, comprising a layer support and a photoconductive layer comprising a photoconductor, a sensitizer, and/or an activator, wherein said photoconductive layer further comprises a high molecular weight binder which is soluble in an alkaline-aqueous or alcoholic solution,

said binder comprising the product of reacting a sulfonyl isocyanate of the formula

$$R—SO_2—NCO,$$

in which R is alkenyl having up to 4 carbon atoms, or phenyl which can be substituted by alkyl having up to 3 carbon atoms, with a hydroxyl-containing polymer in a molar ratio within the range of (0.5 to 1):1.

4,525,445

ELECTROSTATIC TONER COMPRISING THERMOPLASTIC RESIN BINDER FOR NIGROSINE BASE SALT

Pierre R. De Roo, and Serge M. Tavernier, both of Schoten, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Apr. 11, 1984, Ser. No. 599,164

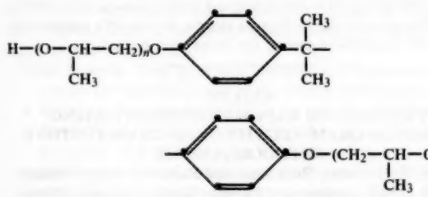
Claims priority, application European Pat. Off., Apr. 13, 1983, 83200514.4

Int. Cl.[3] **G03G** *9/10, 9/14, 9/12*

U.S. Cl. 430—109 **10 Claims**

1. A particulate composition of matter for magnetic brush development of electrostatic charge patterns that is capable of acquiring a net positive charge by mixing with magnetic carrier particles and consists essentially of colorant material and thermoplastic resin binder, said colorant comprising a salt formed from nigrosine base (C.I. 50415B) and at least one carboxylic acid containing one or two carboxylic acid groups and having from 2 to 26 carbon atoms, wherein:

(1) said thermoplastic resin binder includes at least 75% by weight of a polyester derived from fumaric acid or a mixture of fumaric acid and isophthalic acid containing at least 95 mole % of fumaric acid and a polyol blend of propoxylated bisphenol characterized by the formula:



wherein m and n are integers with the proviso that the average sum of m and n is from 2 to 7, said polyester resin being obtained from amounts of acid to polyol such that the ratio of carboxyl groups of said acid to hydroxyl groups of said polyol is in the range of 1.2:1 to 0.8:1 and having a melting point in the range of 60°–90° C.,

(2) said nigrosine base salt has a melting point higher than the melting temperature of the resin binder and is dispersed in said resin binder in a weight ratio of not more than 10% in the form of particles having a particle size range of 0.1 to 10 μm, and

(3) the particle size of the composition is in the range of 3 to 30 μm.

4,525,446

LIQUID DEVELOPER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES COMPRISING ONIUM SALT POLYMER AND AN ANION

Herman J. Uytterhoeven, Bonheiden; Yvan K. Gilliams, Hever; Walter F. De Winter, 's-Gravenwezel; August M. Mariën, Oevel, and Noël J. De Volder, Edegem, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 20, 1983, Ser. No. 563,561

Claims priority, application European Pat. Off., Jan. 20, 1983, 83200085.5

Int. Cl.[3] **G03G** *9/08, 9/12*

U.S. Cl. 430—117 **13 Claims**

1. A liquid developer composition that is suitable for rendering visible electrostatically charged areas which composition contains in an electrically insulating non-polar carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant less than 3, dispersed colouring matter acting as toner particles and at least one onium salt polymer including recurring units incorporating an onium group together with an anion, characterized in that the said anion has at least one of the characteristics (1) to (4) as follows:

(1) contains a negatively charged atom or group of atoms which is sterically embraced by at least two non-ionic substituents containing at least 4 C atoms;

(2) contains a negatively charged atom which is sterically embraced by at least 4 atoms selected from the group consisting of oxygen and halogen;

(3) contains a negatively charged atom or group of atoms the negative charge of which is delocalized over other atoms linked to said atom or group of atoms;

(4) is a radical anion,

whereby the said polymer is adsorbed with a net positive charge on the toner particles.

4,525,447

IMAGE FORMING METHOD USING THREE COMPONENT DEVELOPER

Susumu Tanaka, Aichi, and Kaoru Takebe, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1983, Ser. No. 545,933

Claims priority, application Japan, Nov. 8, 1982, 57-196429; Jan. 26, 1983, 58-11789; Aug. 22, 1983, 58-153600

Int. Cl.[3] **G03G** *13/08, 13/09*

U.S. Cl. 430—122 **6 Claims**

1. An image forming method comprising a step of forming an electrostatic latent image having at least three levels of potential with a first potential representing a first image area, a second potential representing a second image area and a background potential for the first and second images; and a step of developing said electrostatic latent image with a magnetic developer of a mixture of at least three components which includes a magnetic carrier, a first toner triboelectrically chargeable to a specific polarity by contact with the magnetic carrier, and a second toner triboelectrically chargeable by contact with the first toner to a polarity opposite to the polarity of first toner but substantially not triboelectrically chargeable by contact with the magnetic carrier and at least said second toner being a magnetic toner.

4,525,448

METHOD OF FABRICATING SUB-HALF-MICRON-SIZE GATES ON SEMICONDUCTOR SUBSTRATES

Chuni L. Ghosh, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,753

Int. Cl.[3] **G03C** *5/00*

U.S. Cl. 430—314 **13 Claims**

1. A method of fabricating a sub-half-micron-size gate on a support surface of a semiconductor substrate, comprising the steps of

covering at least a section of the support surface that includes the desired location of the gate with a photoresist layer;

masking an area of the photoresist layer that covers said location, such masked area having a size exceeding the desired size of the gate;

subjecting the photoresist layer to overexposure with an

attendant reduction in the size of said masked area down to said desired size of the gate

removing the photoresist layer from a region of the support surface surrounding the reduced-size area;

providing a protective coating at least on said region;

clearing said reduced-size area to provide a recess in said protective coating; and

depositing gate material at least in said recess.

4,525,449

METHOD OF TREATMENT OF COLOR PHOTOGRAPHIC MATERIALS

Junya Nakajima; Kiyoshi Imai, and Takashi Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan

Filed Nov. 1, 1983, Ser. No. 547,617

Claims priority, application Japan, Nov. 1, 1982, 57-192097

Int. Cl.³ G03C *7/40, 5/50*

U.S. Cl. 430—407 **16 Claims**

1. A method of color reversal treatment of an image-wise exposed silver halide color photographic material, comprising the steps of:

treating the material in a first black-and-white developing solution containing a developer and a compound represented by the following general formula (I):

$$R_2\text{-}(S\text{—}R_1)_d\text{—}S\text{—}R_2 \qquad (I)$$

wherein R_1 represents an alkylene group having 2 to 10 carbon atoms, which may have ether bonds, R_2 represents an alkyl group having 2 to 10 carbon atoms, which alkyl group may have substituents or may have ether bonds or ester bonds, and d represents an integer of 0 to 3 and treating the material in a second black-and-white developing solution and fogging and color developing the material.

4,525,450

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL CONTAINING A COUPLER CONTAINING AT LEAST ONE OF A SULFAMOYLPHENYLENESULFONYL, SULFAMOYLAMINOPHENYLENESULFONYL, OR SULFOAMIDOPHENYLENESULFONYL GROUP

Isamu Itoh, and Takeshi Hirose, both of c/o Fuji Photo Film Co., Ltd. No. 210, Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

Filed Mar. 23, 1984, Ser. No. 592,486

Claims priority, application Japan, Mar. 28, 1983, 58-52927

Int. Cl.³ G03C *7/00, 7/32, 1/40*

U.S. Cl. 430—552 **7 Claims**

1. A silver halide color photographic light-sensitive material containing a coupler having at least one of a sulfamoylphenylenesulfonyl group, a sulfamoylaminophenylenesulfonyl group and a sulfonamidophenylenesulfonyl group as a substituent.

4,525,451

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING PHENOL OR NAPHTHOL HAVING SULFAMOYLAMINO GROUP

Nobutaka Ohki, and Yoshinobu Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1984, Ser. No. 600,732

Claims priority, application Japan, Apr. 15, 1983, 58-66629

Int. Cl.³ G03C *1/06, 1/33, 1/40, 7/26*

U.S. Cl. 430—551 **13 Claims**

1. A color photographic silver halide light-sensitive material characterized by containing as a color stain inhibitor a compound comprising a phenol or naphthol ring with at least one substituted or unsubstituted sulfamoylamino group substituted in the ring.

4,525,452

ENZYME IMMUNOASSAY WITH STEP OF IMMERSING SAMPLE IN DEIONIZED WATER

Wendy Jones, Sterling Junction, and Bego Gerber, Belmont, both of Mass., assignors to BTC Diagnostics Limited Partnership, Cambridge, Mass.

Filed Jan. 24, 1983, Ser. No. 460,330

Int. Cl.³ G01N *33/54;* **C12Q** *1/04, 1/29;* **C12R** *1/36*

U.S. Cl. 435—7 **24 Claims**

1. An enzyme immunoassay for the colorimetric detection of an antigen selected from the group consisting of microorganisms and antigenic derivatives of microorganisms, said enzyme immunoassay of the type wherein a biological material comprising said antigen is collected in a collection medium forming a biological sample; a conjugate is formed between an antibody and enzyme, said conjugate is admixed with the sample to be tested for the antigen, said antigen binds with the conjugate to form an antigent/antibody complex in solid phase, the enzyme of the conjugate being bound in the antigen/antibody complex in solid phase, and the presence of said antigen is determined by measuring the activity of said enzyme with a chromogenic substrate, wherein the improvement comprises:

immersing the biological material comprising said antigen in a collection medium consisting of deionized water to form said biological sample, the deionized water deionized to a purity yielding a resistivity of the water of at least 1 megaohm cm; and

maintaining the biological material immersed in said collection medium consisting of deionized water for an immersion period of at least about 15 minutes without adding other reagents to the biological sample during said immersion period, the biological sample permissibly exposed to the atmosphere during the immersion period.

4,525,453

PROCESS FOR RAPIDLY DIFFERENTIATING BETWEEN GRAM-NEGATIVE AND GRAM-POSITIVE MICROORGANISMS

Robert F. Guardino, Rochester, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1982, Ser. No. 436,877

Int. Cl.³ C12Q *1/04;* **G01N** *21/54*

U.S. Cl. 435—34 **18 Claims**

1. A method for differentiating between viable gram-positive and viable gram-negative microorganisms comprising intermingling (a) gram-positive and gram-negative microorganisms, (b) an anionic surfactant in an amount sufficient to selectively inhibit the reduction capability of said gram-positive microorganisms, (c) an electron transfer agent, and (d) a compound capable of being reduced to a detectable species, in the absence of any reduction-inhibiting materials, by both gram-positive and gram-negative microorganisms and determining the presence or absence of the detectable species.

4,525,454
PRODUCTION OF L-4-PHENYL-2-AMINOBUTANOIC ACID BY TRANSAMINATION

J. David Rozzell, Cambridge, Mass., assignor to Genetics Institute, Inc., Boston, Mass.

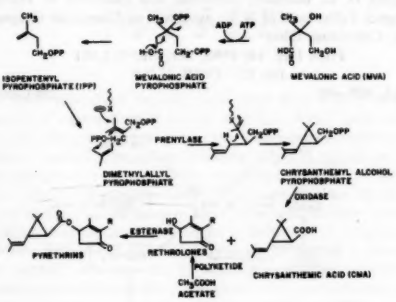
Continuation-in-part of Ser. No. 528,730, Sep. 4, 1983,. This application Aug. 23, 1984, Ser. No. 643,654
Int. Cl.[3] C12P 13/04; C12N 9/10, 9/88; C12R 1/19
U.S. Cl. 435—106 12 Claims

1. A process for producing alpha L-4-phenyl-2-aminobutanoic acid or derivatives thereof, said process comprising reacting 4-phenyl-2-oxobutanoic acid or an ester thereof with L-aspartic acid in the presence of transaminase enzyme to produce L-4-phenyl-2-aminobutanoic acid and oxaloacetate, and decarboxylating said oxaloacetate.

4,525,455
METHOD FOR PREPARING A CELL FREE HOMOGENATE OF *CHRYSANTHEMUM CINERARIAEFOLIUM* (TREV.) BOCC. CONTAINING ENZYMES AND METHODS OF USE

Santo W. Zito, and E. John Staba, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 29, 1983, Ser. No. 489,957
Int. Cl.[3] C12P 7/62, 7/02; C12N 9/14
U.S. Cl. 435—135 60 Claims



1. A method for preparing a cell free homogenate containing bioactive enzyme(s) and cofactor(s) of the pyrethrin pathway of pyrethrin producing Chrysanthemum species or Tagetes species of the family Compositae which comprises homogenizing a mixture comprising:

plant material from pyrethrin producing Chrysanthemum species or Tagetes species of the family Compositae;

a hydrogen bonding inhibitor in an amount effective to competitively inhibit hydrogen bonding of the bioactive enzyme(s) and cofactor(s) by plant phenolics; and

a stabilizing solution comprising a buffer with a pH in the range of about 6-8.5 and a thiol-reducing agent in an amount effective to competitively inhibit oxidation of bioactive enzyme(s) and cofactor(s) containing sulfhydryl groups and/or to competitively inhibit oxidation or covalent bonding of bioactive enzyme(s) and cofactor(s) by plant quinones.

15. A method for the biosynthesis of pyrethrins or labeled pyrethrins comprising:

preparing a cell free homogenate containing bioactive enzyme(s) and cofactor(s) of the pyrethrin pathway of Chrysanthemum species and Tagetes species of the family Compositae; and

adding together and incubating, until such pyrethrins or labeled pyrethrins are biosynthesized, the cell free homogenate and mevalonic acid or labeled mevalonic acid or isopentenyl pyrophosphate or labeled isopentenyl pyrophosphate.

35. A method for the biosynthesis of chrysanthemyl alcohol or labeled chrysanthemyl alcohol comprising:

preparing a cell free homogenate containing bioactive enzyme(s) and cofactor(s) of the pyrethrin pathway of Chrysanthemum species or Tagetes species of the family Compositae;

adding together and incubating the cell free homogenate and mevalonic acid or labeled mevalonic acid isopentenyl pyrophosphate or labeled isopentenyl pyrophosphate; and

hydrolyzing chrysanthemyl alcohol pyrophosphate produced by the incubation.

4,525,456
SUPPORT MATRIX AND IMMOBILIZED ENZYME SYSTEM

Ronald P. Rohrbach, Forest Lake, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 8, 1982, Ser. No. 439,958
Int. Cl.[3] C12N 11/14, 11/02, 11/08
U.S. Cl. 435—176 20 Claims

10. A support matrix comprising a core support on whose surface is deposited a water-insoluble functionalized derivative of polyethylenimine, where the polyethylenimine has a molecular weight from about 1200 to about 100,000, selected from the group consisting of carboxylic acid amides of polyethylenimine, sulfonic acid amides of polyethylenimine, and polyalkylated polyethylenimne.

19. An immobilized enzyme system comprising the support matrix of claim 10 to which there is bound an enzyme.

4,525,457
METHOD OF IMMOBILIZING ENZYMATICALLY ACTIVE MATERIALS

Ko Sakata, Kawasaki, and Hirosuke Imai, Yokohama, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,574
Claims priority, application Japan, Apr. 27, 1982, 57-69510
Int. Cl.[3] C12N 11/10, 11/08
U.S. Cl. 435—178 6 Claims

1. A method of immobilizing enzymatically active materials which comprises bringing an aqueous medium comprising a polycation and an enzymatically active material into contact with a water-insoluble polyanion, whereby the enzymatically active material is fixed as a film on the surface of the water-insoluble polyanion.

2. The method of claim 1 wherein the polycation comprises at least one polymer selected from polymers containing a quaternary ammonium ion group in the backbone, polymers containing a quaternary ammonium salt group in the side chains, polymers containing an amine group or a salt thereof in the backbone, or polymers containing an amine group or a salt thereof in the side chains.

4,525,458
METHOD FOR THE PRODUCTION OF SPHINGOMYELINASE

Shigeyuki Imamura; Hideo Misaki, and Naoki Muto, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan

Filed Sep. 1, 1982, Ser. No. 413,677
Claims priority, application Japan, Sep. 9, 1981, 56-140902
Int. Cl.[3] C12N 9/16; C12R 1/465
U.S. Cl. 435—196 1 Claim

1. A method for the production of sphingomyelinase characterized in that the Streptomyces sp. A 9107 is cultured in a medium and the resulting sphingomyelinase is collected from the culture product.

4,525,459

NEW PURIFIED GLYCOPROTEINS AND USE IN DIAGNOSING INFECTIOUS MONONUCLEOSIS

Mary A. Fletcher, Miami, Fla., assignor to University of Miami, Coral Gables, Fla.

Filed Jan. 27, 1982, Ser. No. 343,235
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[3] G01N *33/50;* B01J *39/06, 41/06;* B01D *9/02*
U.S. Cl. 436—544 20 Claims

1. A mammalian erythrocyte glycoprotein selected from the group consisting of horse and sheep erythrocyte glycoprotein, the amino acid composition of the horse erythrocyte glycoprotein being about 8.1 mole % aspartic acid, about 10.6 mole % threonine, about 10.8 mole % serine, about 9.4 mole % glutamic acid, about 12.3 mole % proline, about 9.2 mole % glycine, about 11.3 mole % alanine, about 4.4 mole % valine, about 0.8 mole % methionine, about 3.5 mole % isoleucine, about 8.2 mole % leucine, about 1.1 mole % tyrosine, about 2.9 mole % phenylalanine, about 1.2 mole % histidine, about 1.3 mole % lysine and about 4.8 mole % arginine, and the amino acid composition of the sheep erythrocyte glycoprotein being about 5.6 mole % aspartic acid, about 8.1 mole % threonine, about 12.9 mole % serine, about 13.0 mole % glutamic acid, about 11.6 mole % proline, about 7.7 mole % glycine, about 9.6 mole % alanine, about 6.2 mole % valine, about 0.5 mole % methionine, about 4.6 mole % isoleucine, about 8.3 mole % leucine, about 4.6 mole % in tyrosine, about 1.2 % phenylalanine, about 1.6% histidine, about 3.2 mole % lysine, about 4.0 mole % arginine, and about 0.3% tryptophan.

12. A process for preparing the mammalian glycoproteins of claim 1 which comprises the steps of:

(a) uniformly suspending dried, ground, hemoglobin-free stroma from mammalian erythrocytes in anhydrous acetone;
(b) refluxing for from about 1 to about 6 hours, filtering and drying the residue;
(c) suspending said dried residue in 100% anhydrous ethanol;
(d) refluxing between about 1 and about 6 hours, filtering and drying the residue;
(e) suspending the dried residue from step (d) in aqueous ethanol of between about 50% and about 80% strength, and repeating step (b);
(f) dissolving the residue from step (e) in water and adding 90% aqueous ethanol, followed by incubating on ice until crystallization occurs, centrifuging and dialyzing the solid layer against a low pH, low ionic strength buffer;
(g) passing the solid from step (f) through a cation exchange resin on a chromatographic column;
(h) collecting the sialic acid containing fractions from the column and drying them;
(i) treating the collected fractions from step (h) by extraction with a known lipid solvent, centrifuging, collecting the aqueous layer and drying it;
(j) repeating step (i) on the product of that step, using a different lipid solvent;
(k) recovering the product of step (j) in lyophilized form;
(l) dissolving the product of step (k) in a low ionic strength buffer containing about 1% neutral detergent;
(m) loading the solution from step (l) on an anion exchange chromatographic column;
(n) washing the column thoroughly with low ionic strength buffer;
(o) eluting the column with aqueous buffer to high salt concentration; and
(p) dialyzing the product of step (o) against water and recovering the product in freeze dried form.

4,525,460

SINGLE-CRYSTAL MATERIAL BASED ON ALUMINIUM GARNETS

Ashot G. Petrosian, ulitsa Abovyana, 39, kv. 16, Erevan; Khachik S. Bagdasarov, ulitsa Profsojuznaya, 115, kv. 46, Moscow; Armen S. Kuzanian, ulitsa Moskovskava, 31, kv. 14; Karine L. Ovanesian, ulitsa Tamaniana, 3, kv. 59, both of Erevan, and Tatyana I. Butaeva, ulitsa Charentsa, 27, kv. 3, Erevan, all of U.S.S.R.

PCT No. PCT/SU82/00010, § 371 Date Oct. 24, 1983, § 102(e) Date Oct. 24, 1983, PCT Pub. No. WO83/02962, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 26, 1982, Ser. No. 552,137
Int. Cl.[3] C04B *27/00;* C30B *29/28*
U.S. Cl. 501—86 6 Claims

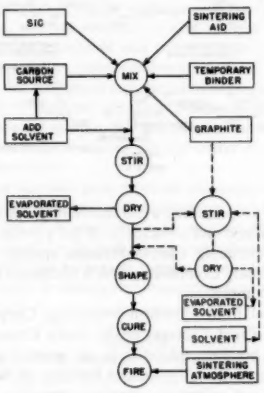
1. A single-crystalline aluminum garnet material consisting of $Re_3Al_5O_{12}$ and 10^{-2} to 3% by weight of the dyeing additive zirconium, wherein Re is an element from the group consisting of yttrium, dysprosium, holmium, erbium, and lutecium.

4,525,461

SINTERED SILICON CARBIDE/GRAPHITE/CARBON COMPOSITE CERAMIC BODY HAVING ULTRAFINE GRAIN MICROSTRUCTURE

Wolfgang D. G. Boecker, Lewiston, and Laurence N. Hailey, Niagara Falls, both of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Dec. 14, 1983, Ser. No. 561,361
Int. Cl.[3] C04B *35/56*
U.S. Cl. 501—90 39 Claims



1. A pressureless-sintered silicon carbide/graphite/carbon composite ceramic body essentially free of uncombined silicon consisting essentially of:

(a) from about 1 to about 48 percent by weight of graphitic elemental carbon and having a total uncombined carbon content of from about 1.5 to about 49 percent by weight;
(b) an effective amount of sintering aid;
(c) the balance being silicon carbide;

the composite body having a homogeneous fine grain microstructure of silicon carbide grains and graphite grains with at least 50 percent of its silicon carbide grains on an area basis having a size not exceeding about 8 microns and an aspect ratio less than about 3, the body having a density of at least 75 percent of theoretical density based on the law of mixtures.

4,525,462
DARK BLUE DYED FURNACE SIGHT GLASS WITH HIGH INFRARED ABSORPTION

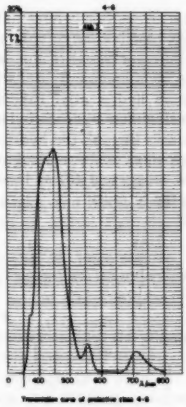
Werner Behr, Alfeld, Fed. Rep. of Germany, assignor to Deutsche Spezialglas AG, Delligsen, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,421

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3220072

Int. Cl.³ C03C *3/04*

U.S. Cl. 501—71 **4 Claims**



1. Dark blue dyed furnace sight glass with a high infrared absorption, characterized by the fact that it has been melted from an amount of basic glass containing iron compounds to which a carbon containing reducing agent is added, its blue coloring being due to at least one cobalt compound and its iron, carbon and cobalt contents being such that the absorption characteristics of the glass in the visible spectral area provide distinctly visible details at slight differences in temperature between different portions of a radiating body and in the infrared spectral area provide substantially no transmittance of wavelengths of about 800 nanometers, the glass characterized by the following composition (in percent by weight):

65–72	SiO_2
0–3	Al_2O_3
0–3	ZrO_2
12–16	Na_2O
0–5	K_2O
2.5–10	CaO
0–4	MgO
2.2–4.9	Fe_3O_4
0.1–0.35	CoO
0.2–0.5	C

4,525,463
SPOUT-FILLING MASS

Heinz Dislich, Am Botanischen Garten 8, D-4100 Duisburg 1, and Horst Richter, Duisburg, both of Fed. Rep. of Germany, assignors to Heinz Dislich, Duisberg and Krupp Stahl Aktiengesellschaft, Bochum, both of, Fed. Rep. of Germany, part interest to each

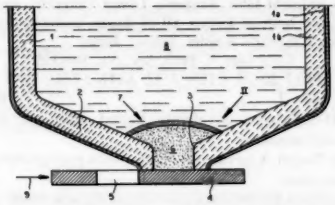
Filed Nov. 3, 1982, Ser. No. 438,807

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214168

Int. Cl.³ B22D *41/10*

U.S. Cl. 501—99 **2 Claims**

1. A particulate filling mass for filling the pouring spout of a casting ladle which consists of essentially 10% by weight carbon, 25% by weight quartz sand and the balance a chromite chromium ore containing 44 to 46% by weight Cr_2O_3, the



chromium ore and the quartz sand having particle sizes up to 1 mm, the carbon having a particle size up to 4 mm.

4,525,464
CERAMIC BODY OF ZIRCONIUM DIOXIDE (ZrO_2) AND METHOD FOR ITS PREPARATION

Nils Claussen, Leonberg; Manfred Rühle, Ditzingen, and Günter Petzow, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Filed Jun. 12, 1984, Ser. No. 619,939

Int. Cl.³ C04B *35/48, 35/50*

U.S. Cl. 501—103 **13 Claims**

1. In a ceramic body of zirconium dioxide or zirconium dioxide containing aluminum oxide, the improvement comprising said ceramic body

being partially stabilized with 0.5 to 5 mole-% of yttrium oxide, 5 to 15 mole-% magnesium oxide, calcium oxide, 5 to 15 mole-% cerium oxide, 5 to 15 mole-% of one or more rare earth dioxides or 5 to 15 mole-% of a combination thereof;

being 30 to 100% in the tetragonal lattice modification; and

having, in the surface region, a content of yttrium oxide, cerium dioxide, magnesium oxide, calcium oxide or rare earth oxide that is 2 to 20 mole-% higher than the average content in said ceramic body, such that the body is covered with a thin layer of a more highly stabilized tetragonal lattice form or one predominantly in the cubic lattice form.

3. A method for the preparation of a ceramic body which is partially stabilized with 0.5 to 5 mole-% of yttrium oxide, 5 to 15 mole-% of magnesium oxide, calcium oxide and/or cerium oxide or one or more rare earth dioxides; is 30 to 100% in the tetragonal lattice modification; and has in the surface region a content of yttrium oxide, cerium dioxide, magnesium oxide, calcium oxide or rare earth oxide that is 2 to 20 mole-% higher than the average content, such that the body is covered with a thin layer of a more highly stabilized tetragonal lattice form of one predominantly in the cubic lattice form, comprising the steps of

placing the surface of an already sintered or only presolidified compact of partially stabilized zirconium dioxide in intimate contact with yttrium oxide, cerium dioxide, magnesium oxide, calcium oxide and/or other rare earth oxide powder, or a zirconium dioxide powder containing at least 12 mole-% yttrium oxide and/or other stabilizer oxides, and then

annealing said sintered or presolidified compact at 1000° to 1600° C., to form a more highly stabilized tetragonal or mainly cubic surface layer of 0.1 to 200 micrometers thickness having a 2 to 20 mole-% higher content of yttrium oxide, cerium dioxide, magnesium oxide, calcium oxide or rare earth oxide than the average content in the ceramic body.

4,525,465

WATER-INSOLUBLE BIOSPECIFIC ABSORBENT CONTAINING ARGININAL DERIVATIVE

Tetsuya Someno, Oomiya; Kazuo Kato, Urawa; Tetsushi Saino, Yono; Shinichi Ishii, Sapporo; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 540,125

Int. Cl.[3] B01J *20/26;* C12N *9/72;* A61K *37/54;* C07C *103/52*

U.S. Cl. 502—7 10 Claims

6. CH-Sepharose covalently bound with pyroglutamyl-lysyl-leucyl-argininal.

7. CM-Biogel A covalently bound with pyroglutamyl-lysyl-leucyl-argininal.

8. A process for producing a biospecific adsorbent comprising pyroglutamyl-lysyl-leucyl-argininal covalently bound with a water-insoluble support, which comprises reacting L-pyroglutamyl-L-lysyl-L-leucyl-L-argininal having its aldehyde group protected with a water-insoluble support having its functional group activated, and then removing the aldehyde-protecting group.

4,525,466

PROCESS FOR SYNTHETIZING ZEOLITES HAVING A MORDENITE STRUCTURE AND HAVING HIGH CATALYTIC ACTIVITY

Enrico Moretti; Valentino Zamboni, both of Milan, Italy; Raymond Le Van Mao, Montreal, Canada; Mario Padovan, and Marcello Solari, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 24, 1982, Ser. No. 444,355

Claims priority, application Italy, Nov. 27, 1981, 25320 A/81

Int. Cl.[3] B01J *29/18*

U.S. Cl. 502—63 8 Claims

5. A process for preparing a catalyst for the disproportioning of toluene, containing a mordenite having a SiO_2:Al_2O_3 molar ratio from 16 to 40, said process comprising the steps of mixing an organic base with H_2O and at least a Na compound, an Al compound, and a Si compound, and being characterized in that said base is $(DEPP)^+OH^-$ or a salt thereof, in that the mixture is crystallized at a temperature from 140° C. to 160° C., in that both said temperature and the SP factor are selected within the area AEFD of FIG. 1 of the drawing, the crystallization time being longer than two days, and in that the following molar ratios between the abovesaid compounds, expressed as oxides, are employed: Na_2O:Al_2O_3=1–10; $(DEPP)_2O$:Al_2O_3=1–15; SiO_2:Al_2O_3=20–70; H_2O:Al_2O_3=500–3,000; H_2O:SiO_2=-25–45; thereafter filtering the crystallization mixture, drying it in an oven for 10–12 hours at 120° C. and activating it in air for 2–10 hours at between 400° C. and 600° C.

6. The process according to claim 5, characterized in that said mordenite is prepared in the acid form by exchange with NH_4Cl and successive calcining between 300° C. and 650° C., the zeolite powder so exchanged being then kneaded with 10–50% by weight of another binding material and being extruded in preselected form, the extruded mixture being heated, dried and activated by treatment in air at high temperature of 500° C. to the beginning of mordenite structural collapse.

7. The process according to claim 6, in which the binding material is selected from the group consisting of clay, SiO_2 and Al_2O_3.

4,525,467

HIGH EFFICIENCY POLYMERIZATION CATALYST COMPONENT FOR USE IN THE POLYMERIZATION OF PROPYLENE AND HIGHER ALPHA-OLEFINS

Terrence Huff, and Eugene E. Poirot, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

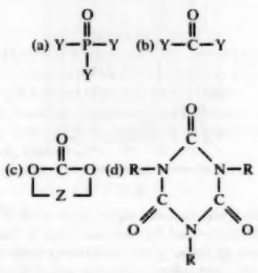
Filed Jan. 16, 1984, Ser. No. 571,052

Int. Cl.[3] C08F *4/64*

U.S. Cl. 502—121 19 Claims

8. A catalyst composition for the polymerization of olefins comprising

(A) An aliphatic hydrocarbon soluble mixed aluminum hydrocarbyl-Lewis base cocatalyst composition comprising (i) at least two different classes of aluminum hydrocarbyls, a first (1) being an aluminum hydrocarbyl halide or mixture of aluminum hydrocarbyl halides, the second (2) being one of an aluminum hydrocarbyl hydride, aluminum trialkyl or mixtures thereof, the hydrocarbyl radical can be an alkyl, cycloalkyl, aryl or aralkyl radical having from 1 to 20 carbon atoms and (ii) at least one Lewis base represented by the formula:



wherein each Y can be —OR′, —NR_2′ and R′ with the proviso that at least two be —OR′ or —NR_2′, Z is an alkylene radical forming a 5 or 6 membered ring with the carbonyldioxy group or Z is alkyl substituted alkylene group wherein the alkyl radical can have from 1 to 8 carbon atoms, R is an aryl, allyl or alkyl group having from 1 to 20 carbon atoms and R′ is an alkyl, cycloalkyl, aryl or aralkyl radical having from 1 to 20 carbon atoms,

(B) A group 4b, 5b, 6b, and 8 transition metal compound.

4,525,468

OLEFIN POLYMERIZATION CATALYST

Mark P. Mack, and Mark L. Shannon, both of Ponca City, Okla., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 429,632, Sep. 30, 1982, Pat. No. 4,440,869. This application Apr. 28, 1983, Ser. No. 489,687

Int. Cl.[3] C08F *4/64*

U.S. Cl. 502—104 8 Claims

1. A method of preparing catalysts for polymerization of alpha-olefins comprising contacting, in substantial absence of proton donors, a soluble magnesium compound of the general formula

$$Mg(OSiR^1R^2R^3)_2$$

with a titanium alkoxide of the formula $Ti(OR^4)_4$ in combination with at least one transition metal alkoxide having a general formula selected from the group consisting of

(a) $M^1(OR^4)_4$ wherein M^1 is at least one metal selected from the group consisting of zirconium, vanadium and hafnium,

(b) $M^2O(OR^4)_3$ wherein M^2 is vanadium,

(c) $[M^3(OR^4)_5]_2$ where M^3 is at least one material selected from the group consisting of niobium and tantalum,

(d) $M^4O_2(OR^4)_2$ and $M^4_2O_3(OR^4)_2$ wherein M^4 is chromium, and

(e) at least one material selected from the group consisting of tungsten alkoxides and molybdenum alkoxides,

in a sauturated aliphatic hydrocarbon solvent to form a solution, then forming a precipitate by chlorinating the solution in the substantial absence of free oxygen and recovering the precipitate for use as a catalyst, wherein each of R^1, R^2 and R^3 is, independently, alkyl groups or alkoxy groups containing from 1 to about 20 carbon atoms or aryl groups, aryloxy groups, cycloalkoxy groups or cycloalkyl groups containing from 6 to 14 carbon atoms, and each R^4 is, independently, alkyl groups or ethericaily substituted alkyl groups containing from 1 to 20 carbon atoms, aryl groups, cycloalkyl groups or ethericaily substituted aryl groups or cycloalkyl groups containing from 6 to 14 carbon atoms.

4,525,469
CATALYST COMPOSITION FOR POLYMERIZING OLEFINS

Takashi Ueda, Ohtake, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,178
Claims priority, application Japan, Oct. 25, 1982, 57-186043
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—125 **10 Claims**

1. A catalyst composition for the polymerization or copolymerization of olefins composed of

(A) a titanium component (a-1) or (a-2),

(a-1) a highly active titanium component containing titanium, magnesium and halogen as essential ingredients, or

(a-2) a highly active titanium catalyst component obtained by treating component (a-1) with an organic compound containing active hydrogen bonded to oxygen, and

(B) an organoaluminum compound component, wherein

(i) when component (A) is the component (a-1), component (B) is an organoaluminum compound component obtained by treating a halogen-containing organoaluminum compound having a halogen/Al atomic ratio of at least 1 but less than 2 with a compound selected from the group consisting of water and organic compounds having active hydrogen bonded to oxygen, and

(ii) when component (A) is the component (a-2), the component (B) is a halogen-containing organoaluminum compound having a halogen/Al atomic ratio of at least 1 but less than 2, and the ratio of the amount (x) of the organic compound having active hydrogen atom bonded to oxygen and/or an oxygen-containing group derived from said organic compound to the amount (y) of titanium, x:y, is 4–100:1.

4,525,470
CATALYST COMPOSITIONS FOR PREPARING POLYORGANOSILOXANES

Charles F. Kohl, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 519,357, Aug. 1, 1983,. This application Aug. 7, 1984, Ser. No. 638,598
Int. Cl.³ B01J *31/02*; C08G *77/06*
U.S. Cl. 502—167 **9 Claims**

1. A catalyst composition for preparing polyorganosiloxanes by the reaction of at least one polyorganosiloxane containing a plurality of silicon-bonded hydroxyl groups, said catalyst composition consisting essentially of (1) at least one salt derived from equimolar amounts of an organic amine containing at least one primary, secondary or tertiary nitrogen atom and an acid selected from the group consisting of mono- and polyfunctional carboxylic acids, mono- and polyfunctional organosulfonic acids, phosphoric acid and sulfuric acid, and (2) at least one unreacted acid selected from the group consisting of fluorinated alkanesulfonic acids and sulfuric acid and where the weight ratio of salt (1) to unreacted acid (2) is from 1:30 to 50:1, respectively.

2. A composition according to claim **1** where said salt is derived from a monoalkylamine or a 1,1,3,3-tetraalkylguanidine wherein the alkyl groups of the mono-alkylamine and tetraalkylguanidine contain from 1 to 8 carbon atoms.

7. A composition according to claim **1** where said unreacted acid is a fluorinated alkanesulfonic acid represented by the formula R_fSO_3H where R_f represents a perfluoroalkyl radical containing from 1 to 12 carbon atoms, a $H(CF_2)_dCF_2$ radical or a $F(CF_2)_dCFHCF_2$—radical and d is 0, 1, or 2.

4,525,471
ATTRITION RESISTANT MICROSPHEROIDAL FLUID BED CATALYSTS CONTAINING THE MIXED OXIDES OF VANADIUM AND PHOSPHORUS

Noel J. Bremer, Kent; Dennis E. Dria, Cleveland Heights; Ernest C. Milberger, Solon; Patricia R. Blum, Macedonia, and Mark L. Nicholas, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 422,120, Sep. 23, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 594,959
Int. Cl.³ B01J *27/14*
U.S. Cl. 502—209 **20 Claims**

1. A process for the preparation of an attrition resistant microspheroidal fluid bed oxidation catalyst containing the mixed oxides of vanadium and phosphorus, comprising:

(a) preparing a vanadium phosphorus mixed oxide containing catalyst precursor;

(b) densifying the catalyst precursor;

(c) comminuting the catalyst precursor to an average particle size less than about one micron in diameter;

(d) forming fluidizable particles having a bulk density greater than or equal to 0.75 grams per cubic centimeter from the densified, comminuted catalyst precursor;

(e) calcining the fluidizable particles under fluidization-type conditions.

4,525,472
PROCESS FOR CATALYST PREPARATION FOR THE HYDRODEMETALLIZATION OF HEAVY CRUDES AND RESIDUES

Alfredo Morales; Roberto Galiasso, and Angel R. Carrasquel, all of Caracas, Venezuela, assignors to Intevep, S.A., Venezuela

Filed Feb. 23, 1983, Ser. No. 469,079
Int. Cl.³ B01J *23/26, 23/28*
U.S. Cl. 502—323 **8 Claims**

1. A catalyst for the hydrotreatment of heavy crudes and residues, comprising

a refractory support material,

said support material having a pore volume of about 1 cm^3/g,

between 40 and 80 percent of said pore volume consisting of pores having diameters greater than 300 Angstroms,

said pores having diameters according to the following approximate percentage distribution:

30 to 35% of pores greater than 1000 Angstroms;

5 to 10% of pores from 300 to 1000 Angstroms;

6 to 11% of pores from 150 to 300 Angstroms;

10 to 12% of pores from 90 to 150 Angstroms;

30 to 40% of pores from 60 to 90 Angstroms;

1 to 7% of pores from 30 to 60 Angstroms; and

less than 1% of pores from 20 to 30 Angstroms

said support material having a surface area of about 270 to about 290 m^2/g; a real density greater than 6 grams per cubic centimeter and

a hydrogenating metallic compound,

the metal component of said hydrogenating compound being selected from the elements of Group VIb of the Periodic Table,

said support material having a limited number of chemical adsorption sites for said hydrogenating metal, such that

during impregnation of said support material by a solution containing said hydrogenating compound between 0.5 and 3% by weight of said hydrogenating compound, calculated as oxide of the corresponding Group VIb metal, with respect to the total weight of the catalyst, is irreversibly adsorbed by said support material.

4,525,473

CEPHALOSPORINS

Shimpei Aburaki, Tokyo; Hajime Kamachi, Urayasu; Yukio Narita; Jun Okumura, both of Yokohama, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

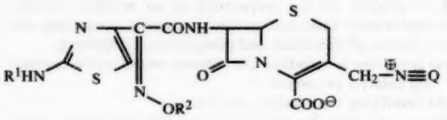
Filed Mar. 30, 1983, Ser. No. 480,602

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.[3] **A61K** *31/545;* **C07D** *501/46*

U.S. Cl. 514—202 **48 Claims**

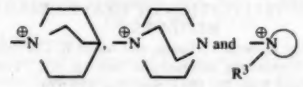
1. A compound of the formula



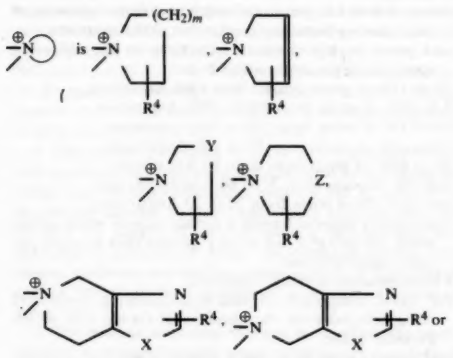
I

wherein R^1 is hydrogen or a conventional amino-protecting group, R^2 is a straight or branched chain alkyl, alkenyl or alkynyl group containing from 1 to 4 carbon atoms, and

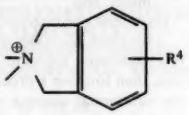
is a quaternary ammonio group selected from



in which R^3 is (lower)alkyl, (lower)alkoxy(lower)alkyl, hydroxy(lower)alkyl with the provision that the hydroxy may not be on the α-carbon, carboxy(lower)alkyl, amino(lower)alkyl with the provision that the amino may not be on the α-carbon, (lower)alkenyl or halo(lower)alkyl, and



-continued



in which R^4 is hydrogen, hydroxy, halogen, (lower)alkyl, hydroxy(lower)alkyl, (lower)alkoxy(lower)alkyl, halo(lower-)alkyl, amino(lower)alkyl, (lower)alkoxy, (lower)alkylthio, (lower)alkenyl, amino, (lower)alkylamino, di(lower)alkylamino, acylamino, acyloxy, carbamoyl, amidino(lower)alkyl, phenyl, pyridyl, amidino or guanidino, m is an integer of from 1 to 3, X is sulfur or —CH=CH—, Y is oxygen or sulfur, Z is oxygen, sulfur or N—R^5, and R^5 is hydrogen or (lower)alkyl, with the provision that

may not be the N-methylpyrrolidinio moiety when R^2 is a C_{1-4} alkyl or alkenyl group; or a nontoxic, pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

4,525,474

INSECTICIDAL N-SUBSTITUTED-2-(NITROMETHYLENE)-TETRAHYDRO-2H-1,3-THIAZINES

Martin Harris, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

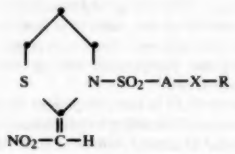
Filed Sep. 14, 1984, Ser. No. 650,610

Claims priority, application United Kingdom, Sep. 14, 1983, 8324664

Int. Cl.[3] **C07D** *279/06;* **A01N** *43/86*

U.S. Cl. 514—226 **6 Claims**

1. A compound of the formula



wherein A is an alkylene moiety of from one to ten carbon atoms, X is oxy (—O—) or thio (—S—) and R is hydrogen or formyl (—C(O)H).

5. An insecticidal composition comprising an effective amount of a compound of claim **1** together with a horticulturally accceptable carrier and optionally a surface-active agent.

4,525,475

PREVENTION OF THROMBOLIC DISORDER WITH IMIDAZOLE DERIVATIVES AND SALTS THEREOF

Peter B. Thorogood, 2 Lansdowne Gardens, London, S.W.8., England

Continuation of Ser. No. 235,000, Feb. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 123,712, Feb. 21, 1980, Pat. No. 4,328,234. This application Sep. 29, 1982, Ser. No. 427,856

Claims priority, application United Kingdom, Feb. 22, 1979, 7906243

Int. Cl.[3] **A61K** *31/46, 31/445, 31/415*

U.S. Cl. 514—304 **2 Claims**

2. A method of treating or preventing a thrombolic disorder in a mammal which comprises administering to said mammal a non-toxic medicinally effective amount of:

1-[2-(6,6-dimethylbicyclo[3.1.1]heptan-2-yl)ethyl]-imidazole

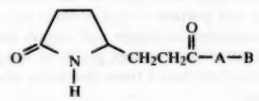
1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)imadazole
1-(bicyclo[2.2.1]heptan-2-ylmethyl)imidazole
1-(6,6-dimethylbicyclo[3.1.1]heptan-2-ylmethyl)imidazole
1-(2-cyclo-hexenespirocyclobut-3'-ylmethyl)imidazole
1-(6,6-dimethylbicyclo[3.1.1]hept-2-en-2-ylmethyl-)imidazole
1-[2-(3,3-dimethylbicyclo[2.2.1]heptan-2-ylidene)ethyl-]imidazole
1-(4-azabicyclo[2.2.2]octan-2-ylmethyl)imidazole
1-(8-methyl-8-azabicyclo[3.2.1]octan-3-ylmethyl) or a pharmaceutically acceptable acid addition salt thereof.

4,525,476
N-[1-OXO-3-(5-OXO-2-PYRROLIDINYL)PROPYL]-ALPHA-AMINOACIDS AND DERIVATIVES AS COGNITION ACTIVATORS

Donald E. Butler; Fred M. Hershenson, and Michael R. Pavia, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 26, 1983, Ser. No. 498,449
Int. Cl.³ C07D *403/06, 401/06, 207/09;* **A61K** *31/40*
U.S. Cl. 514—326 **21 Claims**

1. A compound having the structural formula



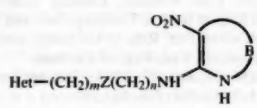
wherein A is a divalent alpha-aminoacid group selected from alanine, valine, leucine, isoleucine, phenylalanine, tryptophan, methionine, glycine, serine, threonine, cysteine, tyrosine, asparagine, glutamine, proline, and pipecolic acid, and B is hydroxy, alkoxy of from one to six carbon atoms, haloalkoxy of from two to six carbon atoms where the halo-atom is attached to carbon two to six of the haloalkoxy group, $—NR_1R_2$ where R_1 and R_2 are independently hydrogen or alkyl of from one to six carbon atoms, or $—OR_3$ where R_3 is a pharmaceutically acceptable cation.

4,525,477
2-THIAZOLYL, ISOTHIAZOLYL, OXAZOLYL AND ISOXAZOLYL ALKYLAMINO-3-NITRO-HETEROCYCLIC COMPOUNDS

Michael L. Roantree, Welwyn Garden City, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 326,877, Dec. 2, 1981, Pat. No. 4,405,624, which is a division of Ser. No. 159,525, Jun. 16, 1980, Pat. No. 4,324,789, which is a division of Ser. No. 43,785, May 30, 1979, Pat. No. 4,238,493. This application Apr. 25, 1983, Ser. No. 488,466
Int. Cl.³ C07D *413/12;* **A61K** *31/44*
U.S. Cl. 514—333 **5 Claims**

1. A compound represented by Structure 1:



Structure 1

in which

Het is attached at a ring carbon and is selected from the group consisting of thiazole, isothiazole, oxazole or isoxazole rings, such rings being unsubstituted or substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen, hydroxy, lower alkoxy or amino;

Z is a sulphur, methylene or oxygen;

m is 0, 1 or 2 and n is 2 or 3 provided that m+n is 3 or 4; and

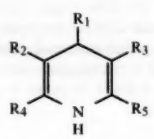
B is a 1,2-ethanediyl ($—CH_2—CH_2—$) or 1,3-propanediyl ($—CH_2CH_2CH_2—$) group, which group is unsubstituted or substituted with one lower alkyl, aryl, aryl lower alkyl or heteroaryl lower alkyl groups, aryl being phenyl or phenyl substituted by lower alkyl, lower alkoxy or halogen and heteroaryl being 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl said heteroaryl being unsubstituted or substituted by lower alkyl or lower alkoxy, or a pharmaceutically acceptable acid addition salt thereof.

4,525,478
CERTAIN 4-ARYL-1,4-DIHYDRO-3,5-PYRIDINEDICARBOXYLATES HAVING VASODILATING AND ANTI-HYPERTENSIVE PROPERTIES

Yoshinari Sato, Takaishi, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 213,048, Dec. 4, 1980, Pat. No. 4,370,334, which is a division of Ser. No. 39,752, May 17, 1979, Pat. No. 4,284,634, which is a continuation-in-part of Ser. No. 809,788, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 701,994, Jul. 1, 1976, Pat. No. 4,145,432. This application Sep. 3, 1982, Ser. No. 414,842
Claims priority, application United Kingdom, Jul. 2, 1975, 27945/75; Sep. 29, 1975, 39854/75; Dec. 16, 1975, 51524/75; Apr. 5, 1976, 13761/76; Dec. 17, 1976, 52720/76; Jun. 6, 1978, 26429/76; Oct. 10, 1978, 39978/78
Int. Cl.³ C07D *211/90, 213/55;* **A61K** *31/455*
U.S. Cl. 514—350 **21 Claims**

1. A compound of the formula:



wherein

R_1 is unsubstituted phenyl, monosubstituted phenyl wherein the substitutent is selected from halogen, nitro, trifluoromethyl, lower alkoxy, lower alkenyloxy, cyano, methyl and lower alkoxycarbonyl, disubstituted phenyl wherein the substituents are selected from 2-chloro-5-nitro, 2,4-dichloro, 3,4-dichloro and 3,4-dimethoxy,

R_2 is lower alkoxycarbonyl,

R_3 is lower alkoxycarbonyl, hydroxy(lower)alkoxycarbonyl, lower alkoxy(lower)alkoxycarbonyl, phenyl(lower-)alkoxy(lower)alkoxycarbonyl, phenoxy(lower)alkoxycarbonyl, N,N-di(lower)alkylamino(lower)alkoxycarbonyl, or N-lower alkyl-N-phenyl(lower)alkylamino(lower-)alkoxycarbonyl,

R_4 is hydroxyimino(lower)alkyl, and

R_5 is lower alkyl.

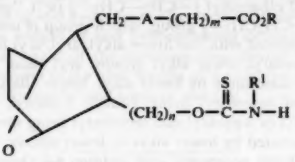
18. A method for effecting vasodilation in humans and mammals which comprises administering thereto an oral daily dose of 0.1 to 500 mg. or 10 to 25% thereof intravenously of the compound of claim **1**.

4,525,479
7-OXABICYCLOHEPTANE SUBSTITUTED THIOCARBAMATE PROSTAGLANDIN ANALOGS USEFUL AS CARDIOVASCULAR AGENTS

Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 29, 1983, Ser. No. 527,070
Int. Cl.³ A61K *31/34;* **C07D** *307/00*
U.S. Cl. 514—469 **14 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A is CH=CH, a single bond, CH_2 or $(CH_2)_2$;

m is 0 to 8 but where A is CH=CH, m is at least 1; n is 1 to 5; R is H or lower alkyl; and R^1 is lower alkyl; lower alkyl including a halo-substituent an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent or an alkylcycloalkyl substituent; aryl; aryl including a lower alkyl substituent, a halogen substituent or a lower alkoxy substituent; aralkyl; lower alkoxy; aralkoxy; cycloalkyl; or cycloalkyl including 1 or 2 halogen substituents, 1 or 2 lower alkyl substituents or 1 or 2 lower alkoxy substituents;

as employed above the term lower alkyl or alkyl by itself or as part of another group contains up to 12 carbons;

as employed above the term aryl by itself or as part of another group refers to monocyclic or bicyclic aromatic groups containing from 6 to 10 carbons in the ring portion;

as employed above the term cycloalkyl by itself or as part of another group refers to saturated cyclic hydrocarbon groups containing 3 to 12 carbons; and wherein $(CH_2)_m$ and $(CH_2)_n$ may be substituted by one or more alkyl substituents.

9. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,525,480

COMPOSITION OF MATTER CONTAINING CINNAMALDEHYDE AND PARABENS

Philip A. Berke, Madison, and William E. Rosen, Summit, both of N.J., assignors to Sutton Laboratories, Inc., Chatham, N.J.

Filed Jun. 10, 1983, Ser. No. 503,166

Int. Cl.³ A01N 37/10

U.S. Cl. 514—544 **8 Claims**

1. A preservative composition comprising cinnamaldehyde and at least one ester of p-hydroxybenzoic acid selected from the group consisting of methylparaben, propylparaben and mixtures thereof having anti-microbial activity in a weight ratio of about 1:8 to 2:1.

4,525,481

ACETALDEHYDE PRODUCTION FROM SYNTHESIS GAS

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,076

Int. Cl.³ C07C 27/06

U.S. Cl. 518—700 **12 Claims**

1. A process for preparing acetaldehyde which comprises contacting a mixture of carbon monoxide and hydrogen with an iodide-free catalyst system comprising elemental ruthenium, an iodide-free quaternary phosphonium or ammonium base or salt and a halide-free cobalt-containing compound at a pressure of 500 psig or greater, and at a temperature of about 150° C. or greater.

4,525,482

PROCESS FOR PRODUCING A GAS CONTAINING METHANE

Kozo Ohsaki, Funabashi; Katsutoshi Kikuchi, Chiba, and Yoshitsugu Hirota, Mobara, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,153

Claims priority, application Japan, Mar. 23, 1983, 58-48372

Int. Cl.³ C07C 1/04

U.S. Cl. 518—707 **16 Claims**

1. In a process for producing a methane-containing gas by contacting a methane synthesis gas comprising hydrogen and carbon monoxide with a methanation catalyst at an elevated temperature within a fixed catalyst bed of a methanation reactor, the improvement which comprises:

flowing said synthesis gas substantially horizontally through said catalyst bed, the flow of said synthesis gas being substantially perpendicular to the longitudinal directions of a plurality of vertically extending cooling tubes which extend through said catalyst bed;

flowing a liquid coolant at the boiling temperature thereof under pressure upwardly through said cooling tubes;

collecting a reaction product gas containing methane from an outlet of said catalyst bed; and

recirculating, without cooling, a portion of said product gas and mixing said portion of said product gas with a fresh feed gas containing hydrogen and carbon monoxide, the molar amount of said product gas to be mixed with said feed gas being less than 5 times the molar amount of said feed gas; and

feeding the mixture of said feed gas and said recirculated product gas into said catalyst bed as said synthesis gas.

4,525,483

CHROMATE ION REMOVAL FROM AQUEOUS SOLUTIONS

Jesse G. Grier, Rte. #1, Gilbertsville, Ky. 42044, and Jimmie R. Hodges, 1408 Crestmont Dr., Downingtown, Pa. 19335

Division of Ser. No. 118,047, Feb. 4, 1980, Pat. No. 4,335,000, which is a continuation-in-part of Ser. No. 956,755, Nov. 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 832,866, Sep. 13, 1977, abandoned. This application Feb. 1, 1982, Ser. No. 344,457

Int. Cl.³ C08D 5/20

U.S. Cl. 521—28 **2 Claims**

1. A composition of matter comprising an intimate mixture of anion exchange resin in the chloride form and weak cation exchange resin in the conditioned hydrogen form, said cation exchange resin being present in said mixture in an amount of from about 0.25 parts to about 2.0 parts by weight for each part by weight of anion exchange resin.

4,525,484

PARTICULATE POLYSTYRENE CONTAINING BLOWING AGENT AND HAVING IMPROVED EXPANDABILITY

Klaus Hahn, Kirchheim; Paul Wittmer, Landau; Isidoor De Grave, Wachenheim; Rupert Schick, Limburgerhof, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 531,658, Sep. 13, 1983,. This application Jun. 21, 1984, Ser. No. 623,197

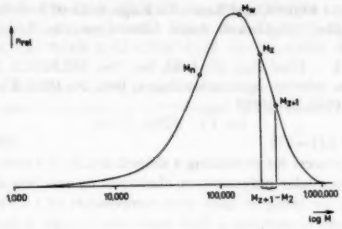
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234660

Int. Cl.³ C08J 9/18, 9/20

U.S. Cl. 521—56 **1 Claim**

1. A particulate polystyrene containing blowing agent and having improved expandability, wherein the polystyrene has a weight-average mean molecular weight M_w, measured by gel permeation chromatography, of from 130,000 to 180,000, and

the high molecular weight flank of the molecular weight distribution curve, the molecular weight being measured by the



same method, is so steep that the difference between the mean values ($M_{Z+1}-M_Z$) is less than 150×10^3.

4,525,485

PRE-EXPANDING PROCESS AND APPARATUS FOR THE SAME

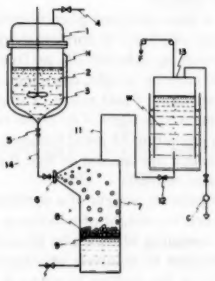
Hirofumi Maeda, Takatsuki; Kyoichi Nakamura, Osaka, and Hisatoshi Fukui, Toyonaka, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 6, 1984, Ser. No. 647,659

Claims priority, application Japan, Sep. 8, 1983, 58-166144; Sep. 8, 1983, 58-166145

Int. Cl.³ C08J *9/22*

U.S. Cl. 521—58 **3 Claims**



1. A process for preparing pre-expanded particles of a thermoplastic resin which comprises; heating under an elevated pressure an aqueous dispersion comprising thermoplastic resin particles containing a volatile foaming agent and an aqueous medium in a pressure vessel; releasing the dispersion from the pressure vessel into a space within a sealed low-pressure vessel wherein the pressure is lower than that in the pressure vessel, whereby expanding the thermoplastic resin particles to give pre-expanded particles; and simultaneously recovering the foaming agent volatilized from the thermoplastic resin particles by discharging the foaming agent out of the space in the low-pressure vessel with controlling the pressure in the low-pressure vessel to substantially a given pressure.

4,525,486

PROCESS FOR PREPARING MODIFIED POLYOLEFIN PARTICLES AND FOAMED ARTICLE MADE FROM THE PARTICLES

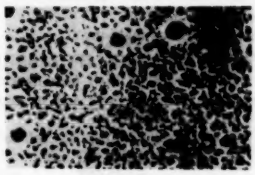
Shigeru Kobayashi, Takatsuki, and Munehiro Nakamura, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1983, Ser. No. 546,523

Claims priority, application Japan, Oct. 30, 1982, 57-191487; Jun. 13, 1983, 58-106368; Jun. 13, 1983, 58-106369

Int. Cl.³ C08J *9/18*

U.S. Cl. 521—59 **17 Claims**



1. A process for preparing modified foamable polyolefin particles which comprises dispersing previously cross-linked polyolefin particles and a polymerizable vinyl monomer capable of dissolving or swelling the cross-linked polyolefin particles in an aqueous medium, the degree of crosslinking of the cross-linked polyolefin particles being from 10 to 80% by weight; impregnating the cross-linked polyolefin particles uniformly inside with the vinyl monomer; polymerizing the vinyl monomer within the impregnated polyolefin particles; and thereafter impregnating the resulting polyolefin particles with a foaming agent.

4,525,487

METHOD FOR MAKING POLYESTER RESIN FOAM BY SPRAYING

James Ahnemiller, Middlebury, and Warren J. Peascoe, Woodbridge, both of Conn., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Aug. 11, 1983, Ser. No. 522,125

Int. Cl.³ C08J *9/10*

U.S. Cl. 521—78 **5 Claims**

1. A method for making cured and foamed polyester by spraying comprising

(A) providing a mixture of (a) 100 parts by weight liquid unsaturated polyester resin, (b) 0.5–8 parts by weight substituted sulfonyl hydrazide blowing agent, (c) 1–4 parts by weight of an organic metal salt promoter for curing said resin, and 0.025–2 parts by weight quaternary ammonium salt;

(B) providing a catalyst effective to causing curing and expanding the mixture of (A) and

(C) bringing into contact the mixtures (A) and (B) and depositing the resulting blend onto a surface by spraying means;

wherein the sulfonyl hydrazide blowing agent has the formula $R(SO_2NHNH_2)_r$ where r equals 1, and R is C_1–C_{12} alkyl, C_5–C_6 cycloalkyl, C_7–C_{10} aralkyl, phenyl, naphthyl or phenyl substituted with halogen, C_1–C_{12} alkyl or C_1–C_4 alkoxy, whereby there is formed a foam free from cracking or splitting.

4,525,488

PREPARATION OF POLYADDITION PRODUCTS OF MANNICH CONDENSATES AND POLYISOCYANATES IN POLYOLS AND THEIR USE IN POLYURETHANES

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,383
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—164 18 Claims

1. A stable dispersion of polyaddition products made by the reaction of

a. a Mannich condensate made by reacting a phenol with an alkanolamine and formaldehyde, in the absence of subsequent water removal and the absence of subsequent alkylene oxide addition, and

b. an organic polyisocyanate in

c. a polyether polyol.

4,525,489

PHOSPHONIUM CARBOXYLATE CATALYSTS FOR THE PREPARATION OF FOAMS CHARACTERIZED BY ISOCYANURATE, AND/OR URETHANE LINKAGES

Thirumurti Narayan, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 200,508, Oct. 24, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,244
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—108 12 Claims

1. A process for the preparation of a cellular foam characterized by isocyanurate linkages which comprises reacting an organic polyisocyanate in the presence of a blowing agent and a catalytically sufficient amount of a catalyst which is the reaction product of

(a) a tertiary phosphine,

(b) an alkylene oxide containing from 2 to 18 carbon atoms, and

(c) a carboxylic acid in a ratio of 0.75 mole to 1.25 moles of alkylene oxide to 0.75 equivalent to 1.25 equivalents of acid per equivalent of phosphorus.

4,525,490

HIGH TEAR STRENGTH FLEXIBLE URETHANE FOAM COMPOSITION AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Filed Jul. 2, 1984, Ser. No. 627,191
Int. Cl.[3] C08G *18/14, 18/32, 18/48*
U.S. Cl. 521—124 22 Claims

1. A flexible polyurethane foam composition characterized by a high tensile or tear strength, which foam composition is prepared by reacting

(a) 100 parts by weight of a MDI-polyol prepolymer, which prepolymer is prepared by reacting 100 parts of MDI having a functionality of about 2.4 or less with from about 35 to 75 parts by weight of an ethylene oxide-capped polyol;

(b) about 2 to 10 parts by weight of a tetraethylene glycol; and

(c) about 90 to 120 parts by weight of an ethylene oxide-capped polypropylene glycol polyol, the reaction carried out in the presence of a blowing amount of a blowing agent and a catalytic amount of a polyurethane catalyst to produce a flexible polyurethane foam of high tensile or tear strength.

4,525,491

PROCESS FOR PRODUCING A POLYURETHANE ELASTOMER BY REACTION INJECTION MOLDING

Shigeyuki Narisawa, Yokohama; Masahiko Funaki, Chigasaki; Hiroaki Kojima, and Kazuhiko Kuga, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,516
Claims priority, application Japan, Dec. 24, 1982, 57-225784; Apr. 8, 1983, 58-60985
Int. Cl.[3] B29D *27/00*
U.S. Cl. 521—174 39 Claims

1. A process for producing a shaped article of a non-cellular or microcellular polyurethane elastomer by reaction injection molding by using at least two components of (A) a polyol component comprising a high molecular weight polyol and a chain extender as essential ingredients and (B) an isocyanate component comprising a polyisocyanate compound as essential ingredient, characterized in that substantially all or at least 80% by weight of said high molecular weight polyol is composed of a polyoxyalkylene polyol, and the polyoxyalkylene polyol is a single or mixed polyoxyalkylene polyol which has an average hydroxyl number of from 2.0 to 3.5 and an average hydroxyl value of from 15 to 60 and contains at least 5% by weight, on an average, of oxyethylene groups at the terminal portions of the oxyalkylene chain and in which the total oxyethylene group content is, on an average, less than 21% by weight and the average unsaturated monool content is at most 0.085 meq/g.

37. A shaped article of a polyurethane elastomer produced by the process according to claim 1.

4,525,492

MODIFIED PHENOLIC FOAMS

Mary H. Rastall, Sarnia; Norman H. Ng, Mississauga, and Edwin J. MacPherson, Sarnia, all of Canada, assignors to Fiberglas Canada Inc., Toronto, Canada

Filed Jun. 4, 1982, Ser. No. 385,260
Int. Cl.[3] C08G *8/00;* C08J *9/04*
U.S. Cl. 521—181 20 Claims

1. A method of making a phenolic foam material consisting essentially of the steps of:

(1) preparing a base-catalyzed phenol-formaldehyde resole having a mole ratio of phenol to formaldehyde of between 1:3 and 1:4.5 and containing substantially no free phenol; and

(2) reacting 100 parts by weight, calculated as resin solids, of an aqueous solution of said resole of step (1) with:

(a) 10 to 55 parts by weight of a co-reactant selected from the group consisting of urea, melamine and dicyandiamide to reduce the amount of free formaldehyde contained in said resole;

(b) 0.1 to 10 parts by weight of a surfactant;

(c) 3 to 25 parts by weight of a blowing agent; and

(d) a catalyst consisting of an acidic material to reduce the pH of the mixture to below 4, or a basic material to increase the pH of the mixture to above 8.

9. A foamable phenolic composition consisting essentially of:

(1) 100 parts weight, calculated as resins solids, of an aqueous solution of a base-catalyzed phenol-formaldehyde resole having a mole ratio of phenols to formaldehyde of between 1:3 and 1:4.5 and containing substantially no free phenol;

(2) 10 to 55 parts by weight of a co-reactant selected from the group consisting of urea, melamine and dicyandiamide;

(3) 0.1 to 10 parts by weight of a surfactant;

(4) 3 to 25 parts by weight of a blowing agent; and

(5) a catalyst consisting of an acidic material to reduce the pH of the reaction mixture to below 4, or a basic material to increase the pH of the reaction mixture to above 8.

4,525,493

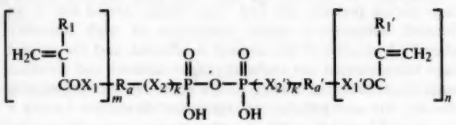
HIGHLY WATER-RESISTANT ADHESIVE

Ikuo Omura, and Junichi Yamauchi, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jan. 25, 1984, Ser. No. 573,618
Claims priority, application Japan, Jan. 31, 1983, 58-15072
Int. Cl.[3] A61K *6/02*; C08F *4/34*, *130/02*; C09K *3/00*
U.S. Cl. 523—116 23 Claims

1. An adhesive which comprises

(a) 1 part by weight of a compound of the formula



wherein

R_1 and R_1' are H or a methyl group,

X_1, X_1', X_2, and X_2' are O, S, or NR_α;

wherein

R_α is H or a $C_{1\text{-}6}$ alkyl group,

m is an integer of 1 to 4,

n is an integer of 0 to 4,

k and k' are 0 or 1,

R_a is a $C_{8\text{-}40}$ organic residue having a valence of (m+1), and

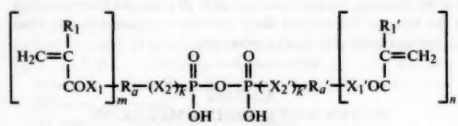
R_a' is a $C_{1\text{-}40}$ organic residue having a valence of (n+1); and

(b) 0 to 199 parts by weight of a monomer which is copolymerizable with the compound of (a).

19. A method for restoring a decayed tooth which comprises:

(I) applying an adhesive to the surface of the tooth cavity; said adhesive comprising

(a) 1 part by weight of a compound of the formula



wherein

R_1 and R_1' are H or a methyl group,

X_1, X_1', X_2, and X_2' are O, S, or NR_α;

wherein

R_α is H or a $C_{1\text{-}6}$ alkyl group,

m is an integer of 1 to 4,

n is an integer of 0 to 4,

k and k' are 0 or 1,

R_a is a $C_{8\text{-}40}$ organic residue having a valence of (m+1), and

R_a' is a $C_{1\text{-}40}$ organic residue having a valence of (n+1),

(b) 0 to 199 parts by weight of a monomer which is copolymerizable with said compound (a), and

(c) 0.01 to 20 parts by weight of a curing agent per 100 parts by weight of the polymerizable monomers of (a)+(b), and

(II) subsequently filling the cavity with a dental filling material comprising a polymerizable monomer, a filler, and a curing agent.

4,525,494

HIGH STRENGTH FLAME RESISTANT POLY-OLEFINS COMPRISING SURFACE COATED ALUMINA HYDRATE PLUS ORGANIC TITANATE AND METHODS OF MAKING THE SAME

Robert Andy, c/o Washington Penn Plastic Co., Inc., 2833 W. Chestnut St., Washington, Pa. 15301

Filed Jun. 9, 1981, Ser. No. 271,852
Int. Cl.[3] C08K *9/04*, *5/56*; C08F *210/06*, *10/06*
U.S. Cl. 523—200 7 Claims

1. A flame retardant polypropylene composition comprising about 60% to 64% alumina hydrate surface coated with about 1.0 wt. % of isostearic acid, about 0.25% to 1% organic titanate and the balance polypropylene resin.

4,525,495

MINERAL FILLED COMPOSITES

Linneaus C. Dorman, and Paul A. Meyers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1983, Ser. No. 516,081
Int. Cl.[3] C08K *3/34*
U.S. Cl. 523—205 40 Claims

1. A composite material consisting essentially of from about 25 to about 75 percent by weight of an inorganic mineral filler which has been surface-modified by treatment with a partially hydrolyzed polyoxazoline and from about 75 to about 25 percent by weight of an α-amino acid polymer.

4,525,496

SELF-INVERTING WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE POLYMERS

Timothy J. Adaway; Harold G. Fravel, Jr., both of Midland, and James P. Easterly, Jr., Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1981, Ser. No. 284,296
Int. Cl.[3] G21K *1/10*
U.S. Cl. 523—337 15 Claims

1. A self-inverting, stable water-in-oil emulsion comprising (1) a discontinuous aqueous phase containing a water-soluble polymer which discontinuous phase is dispersed in (2) a continuous oil phase wherein the emulsion contains an inverting amount of an inverting surfactant and an emulsifying amount of a water-in-oil emulsifier, said emulsion having been prepared by polymerizing a water-in-oil emulsion of a water-soluble ethylenically unsaturated monomer containing a portion of the inverting surfactant and adding the remainder of said inverting surfactant to the resultant water-in-oil emulsion of water-soluble polymer subsequent to polymerization, said portion added prior to the completion of polymerization being a sufficient amount of a nonionic surfactant to increase the degree of inversion when the water-in-oil emulsion of water-soluble polymer is inverted into a continuous aqueous phase.

4,525,497

PROCESS FOR PRODUCING EPOXY-TYPE-LACQUER

Seishichi Kobayashi; Tetsuo Miyazawa, both of Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,081
Claims priority, application Japan, Jan. 26, 1983, 58-9965
Int. Cl.[3] C09D *3/52*, *3/58*, *3/66*, *3/76*
U.S. Cl. 523—400 9 Claims

1. A process for producing an epoxy lacquer, which comprises reacting a liquid epoxy resin having about one bisphenol A skeleton on an average on the molecular chain and derived from bisphenol A and an epihalohydrin, with bisphenol A in the presence of a catalyst in an inert organic solvent to prepare a concentrated solution of an epoxy resin having a number average molecular weight of from 2,000 to 10,000, stopping the reaction by adding an organic solvent to the concentrated solution to dilute it and maintain it at a temperature lower than

that at which said catalyst is active, and mixing the resulting diluted solution with a solution of a resin having a functional reactive group acting as a curing agent for the epoxy resin.

4,525,498

POLYESTER FIBER REINFORCED MOLDING COMPOUNDS

Kenneth E. Atkins, South Charleston, and Robert R . Gentry, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 194,070, Oct. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 094,949, Nov. 16, 1979, abandoned. This application Jan. 12, 1984, Ser. No. 569,591

Int. Cl.³ C08L *31/04, 63/00, 67/06*

U.S. Cl. 523—511 **23 Claims**

1. In a low profile additive composition containing a thermosetting unsaturated polyester, a thermoplastic polymer additive to control shrinkage, and an ethylenically unsaturated polymerizable monomer suitable for use in molding applications, the improvement which comprises incorporating into said mixture an epoxy compound having at least one 1,2-epoxy group per molecule, said epoxy compound being essentially free of reactive unsaturation.

4,525,499

NON-AQUEOUS DISPERSION TYPE RESIN COMPOSITION

Masaaki Hayashi, Tokyo, and Hiroharu Sasaki, Yamato, both of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed May 17, 1984, Ser. No. 611,144

Claims priority, application Japan, May 26, 1983, 58-93277; May 30, 1983, 58-95380; Aug. 26, 1983, 58-155920

Int. Cl.³ C08L *67/06;* **C09D** *3/64, 3/80, 5/02*

U.S. Cl. 523—523 **13 Claims**

1. A non-aqueous dispersion type resin composition comprising (I) a non-polar or slightly polar aliphatic hydrocarbon solvent as a dispersion medium, and (II) particles stably dispersed in the dispersion medium, wherein each of said particles is composed of:

(A) from 20 to 70% by weight of a disperse particle made of (a) a polyester-modified vinyl copolymer containing a hydroxyl group, (b) a vinyl copolymer containing a hydroxyl group or (c) a vinyl ester-modified vinyl copolymer containing a hydroxyl group, and

(B) from 80 to 30% by weight of a vinyl resin dispersion stabilizer surrounding the disperse particle as a protective layer, which has a component compatible with the disperse particle or is chemically bonded thereto and which is solvated by the dispersion medium, said dispersion stabilizer being a copolymer of from 5–30% by weight of (i) an N-alkoxymethylated monomer of an α,β-monoethylenically unsaturated carboxylic acid amide, from 5–60% by weight of (v) an α,β-monoethylenically unsaturated monomer represented by the general formula:

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-COOC_nH_{2n+1}$$

where R is H or CH_3, and n is an integer of 6–18, and from 10–90% by weight of (ii) an α,β-monoethylenically unsaturated monomer other than the monomer (i) and (v), and said dispersion medium is capable of dissolving the dispersion stabilizer and incapable of dissolving the disperse particles.

4,525,500

POLYMER-MODIFIED CEMENT MORTARS AND CONCRETES AND PROCESSES FOR THE PRODUCTION THEREOF

Michael E. Lynn, Tonbridge, United Kingdom, assignor to Marley Tile A.G., United Kingdom

Filed Jul. 6, 1982, Ser. No. 395,739

Claims priority, application United Kingdom, Jul. 7, 1981, 8120926

Int. Cl.³ C04B *7/02*

U.S. Cl. 524—5 **13 Claims**

1. A process for the production of mortars and concretes which comprises curing a composition which contains hydraulic cement and an aqueous dispersion of a polymer or copolymer of a methacrylic or acrylic acid ester by means of a two stage curing process, the first stage being carried out at an elevated temperature under conditions of high humidity whereby hydration of the cement is effected, and the second stage being carried out under drying conditions and elevated temperature whereby curing of the polymer or copolymer is effected, the said polymer or copolymer dispersion having a viscosity of less than 1,500 cps when measured by means of a Brookfield LVT viscometer using spindle 2, 12 rpm at a temperature of 23° C., and a minimum film-forming temperature (MFT) of not lower than 5° C., wherein the polymer or copolymer is present in an amount of from 10 to 40% based upon the weight of cement in the composition.

4,525,501

PROTECTION AGAINST SOILING

Edward C. Norman, and Howard A. Dowell, both of Downingtown, Pa., assignors to Enterra Corporation, Lionville, Pa.

Division of Ser. No. 066,022, Aug. 13, 1979, Pat. No. 4,347,266. This application Oct. 5, 1981, Ser. No. 308,261

Int. Cl.³ C08L *5/04*

U.S. Cl. 524—28 **9 Claims**

1. A protective composition that deposits a solid protective coating film which can be flushed off with water, said composition being an aqueous dispersion of a water-dispersed film former containing about ¼% to about 10% of the film former by weight, a hydrophilic plasticizer for the film former, the amount of such plasticizer being more than twice that of the film former by weight, the composition containing a levelling agent for the plasticized film former, the agent being in an amount that causes the composition to essentially uniformly wet a water-repellent surface, the composition being removable by flushing with a water jet after drying and then standing in the hot sun for several days, and the composition also containing not over 2% total surfactant.

4,525,502

WATER BASED RESIN EMULSIONS

Frank J. Traver, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 5, 1983, Ser. No. 491,795

Int. Cl.³ C08K *5/17;* **C08L** *83/06;* **C09D** *3/82, 5/02*

U.S. Cl. 524—96 **35 Claims**

1. A uniformly coatable water-based silicone resin emulsion comprising:

(a) 100 parts by weight of at least one organopolysiloxane resin composition consisting essentially of zero to 50 percent by weight monofunctional units of the formula $R_3SiO_{0.5}$, zero to 60 percent by weight difunctional units of the formula R_2SiO, zero to 100 percent by weight trifunctional units of the formula $RSiO_{1.5}$, and zero to 60 percent by weight tetrafunctional units of the formula SiO_2 wherein R is a substituted or unsubstituted monovalent hydrocarbon radical and said organopolysiloxane resin has approximately 1.0 to 1.8 R groups for each silicon atom;

(b) 0.25 to 50 parts by weight of a single emulsifying agent per 100 parts of said organopolysiloxane resin wherein

said emulsifying agent is comprised of the salt of a C_6–C_{30} monocarboxylic aliphatic acid and ammonia or a primary, secondary or tertiary amine of the formula $H_aNR'_b$, wherein a and b are positive integers from 1 to 3 and a+b=3, and wherein R' is a monovalent hydrocarbon, halogenated hydrocarbon or heterocyclic radical of from 1 to 30 carbon atoms, or a mixture of such salts, wherein said emulsifying agent is effective for dispersing said organopolysiloxane resin in a water-based emulsion; and

(c) sufficient water to provide a stable aqueous emulsion.

8. An emulsion as in claim **1** wherein said salt is one or a mixture of the reaction products of a monocarboxylic acid selected from oleic acid, stearic acid, linoleic acid, lauric acid, palmitic acid, linolenic acid, capric acid or caprylic acid, with an amine selected from ammonia, morpholine, or triethanolamine.

4,525,503

PIPERIDINE DERIVATIVES WHICH ARE STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Casalecchio di Reno, Italy, assignor to Ciba-Geigy S.p.A., Bologna, Italy

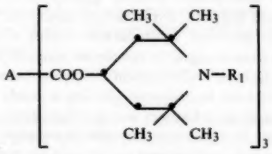
Division of Ser. No. 215,925, Dec. 12, 1980, Pat. No. 4,369,321. This application Sep. 8, 1982, Ser. No. 415,919

Claims priority, application Italy, Dec. 21, 1979, 28324 A/79

Int. Cl.[3] **C08K** *5/34;* **C07D** *401/12*

U.S. Cl. 524—98 **8 Claims**

1. A compound of the formula



or an acid addition salt thereof, in which R_1 represents

(a) hydrogen,

(b) C_1–C_{12}-alkyl,

(c) $—CH_2CN$

(d) C_3–C_{12}-alkenyl,

(e) C_3–C_{12}-alkinyl,

(f) benzyl,

(g) benzyl substituted by 1 to 3 C_1–C_4-alkyl radicals,

(h) hydroxybenzyl,

(i) hydroxybenzyl substituted by 1 to 3 C_1–C_4-alkyl radicals,

(j) a $—COR_8$, $—COOR_8$, $—CH_2COOR_8$ or $—CONR_8R_9$ radical in which R_8 and R_9, which may be identical or different, represent

(1) linear or branched C_1–C_{12}-alkyl,

(2) C_3–C_{12}-alkenyl,

(3) C_5–C_{12}-cycloalkyl,

(4) phenyl,

(5) phenyl substituted by 1 to 3 C_1–C_8-alkyl radicals,

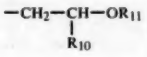
(6) hydroxyphenyl,

(7) hydroxyphenyl substituted by 1 to 3 C_1–C_8-alkyl radicals,

(8) C_7–C_{12}-aralkyl, or

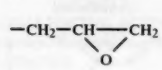
(9) 2,2,6,6-tetramethyl-piperidin-4-yl,

(k) a



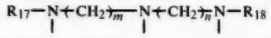
radical, in which R_{10} is hydrogen methyl or phenyl and R_{11} is hydrogen, $—R_8$, $—COR_8$ or $—CONR_8R_9$, in which R_8 and R_9 are as defined above, or

(l) a

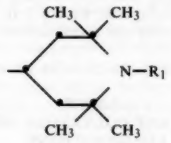


radical;

and A is a radical of the formula



in which R_{17} and R_{18} may be identical or different and represent C_1–C_{12} alkyl, C_5–C_{12} cycloalkyl or a radical of the formula



in which R_1 is as defined above, and m and n, which may be identical or different, are integers from 2 to 6, or A is a trivalent radical of a 6–7-membered heterocyclic compound containing 3 nitrogen atoms in the ring, with the free valencies on the three nitrogen atoms.

4,525,504

STABILIZED POLYESTER COMPOSITIONS SUITABLE FOR OUTDOOR APPLICATIONS

John C. Morris, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,034

Int. Cl.[3] **C08K** *5/34, 5/07, 5/10*

U.S. Cl. 524—99 **25 Claims**

1. A polyester composition having a 264 psi heat deflection temperature greater than 60° C. comprising

A. a dicarboxylic acid component wherein at least a major portion of which is 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 65%,

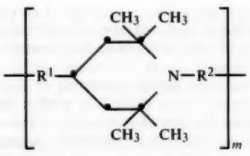
B. a glycol component, wherein at least a major portion of which is 2,2,4,4-tetramethyl-1,3-cyclobutanediol,

C. a stabilizing effective amount of the combination of

1. at least one ultraviolet light stabilizing compound compatible with said polyester, and

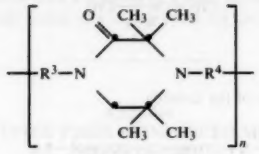
2. at least one hindered amine light stabilizing compound having the formulae

I



or

-continued



wherein m and n are each integers of from 1 to 20, R^1, R^2, R^3 and R^4 are each independently selected from hydrogen, substituted or unsubstituted alkyl having 1 to 20 carbon atoms, aryl having 6 to 22 carbon atoms, alkylene having 1 to 20 carbon atoms, cycloalkylene having 3 to 12 carbon atoms, hydroxyalkyl having 1 to 18 carbon atoms, and esters of said hydroxyalkyl; and alkylenecarboxylic acid having 2 to 18 carbon atoms and esters, amides and metal salts of said alkylenecarboxylic acid.

4,525,505

FIRE-RESISTANT POLYAMIDE MOULDING COMPOSITIONS

Heinz Bonten; Werner Nielinger; Dietrich Michael, and Heinrich Haupt, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,302

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248330

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—100 **8 Claims**

1. A polyamide moulding composition containing from 10 to 18%, by weight, of melamine and from 1 to 7%, by weight of a thermoplastic polyacetal.

4,525,506

POLYHYDRIC ALCOHOL ETHERS OF 2,2,6,6-TETRAMETHYL-4-PIPERIDONE KETALS AND SYNTHETIC RESIN COMPOSITIONS

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Ageo; Toshihiro Shibata, Omiya, and Ryozo Arata, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

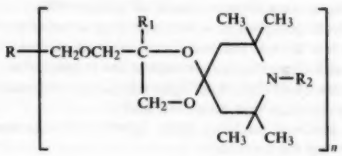
Filed Mar. 25, 1983, Ser. No. 478,610

Claims priority, application Japan, Mar. 31, 1982, 57-53270

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—102 **26 Claims**

1. Polyhydric alcohol ethers of 2,2,6,6-tetramethyl-4-piperidone ketals having the formula:



wherein:

R is selected from the group consisting of alkylene having from one to about eight carbon atoms and alkyleneoxyalkylene in which each alkylene has from two to about eight carbon atoms;

R_1 is selected from the group consisting of hydrogen and alkyl having from one to about four carbon atoms;

R_2 is selected from the group consisting of hydrogen; oxyl O; alkyl, hydroxy alkyl and epoxyalkyl having from one to about eighteen carbon atoms; acyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eighteen carbon atoms; phenyl; phenalkyl and alkylphenyl having from seven to about twenty-four carbon atoms; and

n is a number from 3 to 6.

4,525,507

HIGH FLASH POINT/LOW SURFACE ENERGY SOLVENT SYSTEMS FOR POLYIMIDE CONFORMAL COATINGS

Mouhanad Chaker, 23 Moore Ct., Burlington, Vt. 05401; Roger J. Clark, R.D. #2, P.O. Box 540, Underhill, Vt. 05489, and James S. Hayes, 828 Hastings La., Warrenton, Va. 22186

Filed Dec. 30, 1983, Ser. No. 567,033

Int. Cl.³ C08L *79/08*

U.S. Cl. 524—104 **7 Claims**

1. An improved wire enamel consisting essentially of the following materials by weight wherein basis is wire enamel weight:

at least 50% by wt. of a polar organic solvent which is a substituted aliphatic hydrocarbon having a dipole moment of about 3 to about 5 Debyes or a substituted aromatic hydrocarbon having a dipole moment of about 0.0 to about 0.62 Debye and is selected from the group consisting of N,N-dimethylacetamide, N,N-dimethylformamide, 1-methyl-2-pyrrolidone, dimethylsulfoxide, toluene, p-xylene, m-xylene and o-xylene;

about 2–8% by wt. of a polyimide precursor which can be cured to yield a polyimide polymer;

about 0.5 to about 25% by weight of a substituted aliphatic hydrocarbon solvent for said polyimide precursor having a surface tension and polarity greater than that of the halogenated aliphatic hydrocarbon described below or a substituted aromatic hydrocarbon having a dipole moment less than or equal to the dipole moment of the halogenated aliphatic hydrocarbon described below, the substituted aliphatic hydrocarbon having a dipole moment of about 1 to about 3 Debyes and a surface tension of about 22 to about 35 dynes/cm, the substituted aliphatic hydrocarbon and the substituted aromatic hydrocarbon being different from the polar organic solvent and being selected from the group consisting of esters, alcohols, ketones, amines and amides;

about 5 to 40% by wt.. of a halogenated aliphatic hydrocarbon having a dipole moment of 0.0 to 0.8 Debye and a surface tension less than 22 dynes/cm, the halogenated aliphatic hydrocarbon having a boiling point less than 49° C.; and

0 to about 1% by wt. of an organosilane which increases the adhesion of the polyimide to an underlying substrate.

4,525,508

PLASTICIZED REINFORCED COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 334,636, Dec. 28, 1981, abandoned, which is a continuation of Ser. No. 755,025, Dec. 28, 1976, abandoned. This application May 12, 1983, Ser. No. 494,031

Int. Cl.³ C08K *3/10, 5/52, 3/26;* **C08L** *71/04*

U.S. Cl. 524—140 **33 Claims**

1. A reinforced, plasticized thermoplastic composition comprising:

(a) a polyphenylene ether resin;

(b) a plasticizer therefor in an amount at least sufficient to reduce the temperature of optimum extrusion at least about 25° F., said amount being at least about 15 parts per hundred parts by weight of said resin; and

(c) a mineral reinforcing agent selected from the group consisting of aluminum silicate (clay), talc, zinc oxide, titanium dioxide, barium sulfate, calcium carbonate, and antimony oxide, said agent being present in an amount at least sufficient to provide enhanced stiffness in compari-

sion with a corresponding composition not containing said mineral reinforcing agent, said amount be at least about 20 parts per hundred parts by weight of resin.

4,525,509

METHOD FOR PRODUCING FREE-FLOWING, WATER-SOLUBLE POLYMER GELS

Wood E. Hunter, Pittsburgh, Pa., and Gary P. Craun, Wickliffe, Ohio, assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1983, Ser. No. 562,303

Int. Cl.³ C08J 3/12; C08K 5/52; C08L 39/00

U.S. Cl. 524—141 **10 Claims**

1. A method for preparing free-flowing, water-soluble polymer gels comprising:

(a) reducing the size of a water-soluble polymer gel made from monomers selected from the group consisting of dimethyldiallyl ammonium chloride, diethyldiallyl ammonium chloride, methacryloyloxyethyl trimethyl ammonium chloride, acryloyloxyethyl trimethyl ammonium chloride, methacryloyloxyethyl trimethyl ammonium methosulfate, acryloyloxyethyl trimethyl ammonium and methacrylamido propyl trimethyl ammonium chloride, alone or copolymerized with acrylamide, methacrylamide and N,N-dimethylacrylamide or mixtures thereof, by a size-reduction means, so as to produce polymer gel particles which are less than ¼ inch in their longest dimension; and

(b) adding to the size-reduced polymer gels of Step (a) 0.001 to 20 percent, by weight, of an amphipathic anionic phosphate ester, based on the total weight of said amphipathic compound and said polymer gel, thereby reducing the adhesion of said gel particles to themselves and other substances.

4,525,510

THERMOSETTING LATEX COATING COMPOSITIONS PRODUCED BY COPOLYMERIZATION IN AQUEOUS EMULSION IN THE PRESENCE OF WATER-INSOLUBLE POLYHYDRIC ALCOHOL

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 111,076, Jan. 10, 1976, Pat. No. 4,321,176. This application Feb. 17, 1981, Ser. No. 234,953

Int. Cl.³ C08K 5/42, 5/41

U.S. Cl. 524—156 **10 Claims**

1. A thermosetting latex coating composition comprising a copolymer of monoethylenically unsaturated monomers copolymerized in aqueous emulsion in the presence of an anionic surfactant and about 1% to about 25%, based on the weight of the materials which are copolymerized, of a liquid water-insoluble polyhydric alcohol, said monomers including at least about 80% of nonreactive monomers and from about 0.5% to about 10%, based on the weight of the materials which are copolymerized, of a monomer carrying a reactive group capable of reacting with the hydroxy groups present when the latex is deposited and dried, said reactive group being a C_1–C_8 N-alkylol group etherified with a C_1–C_8 alcohol.

4,525,511

METHOD AND COMPOSITIONS FOR IMPROVING BONDING TO PAINTED SURFACES

Michael D. Kirby, Lakewood, and Michael P. Mazzeo, Hightstown, both of N.J., assignors to Essex Specialty Products, Inc., Sayreville, N.J.

Filed Apr. 6, 1984, Ser. No. 597,533

Int. Cl.³ C08K 5/42

U.S. Cl. 524—158 **5 Claims**

1. A primer composition adaptable to application to a painted surface to improve the adhesion of a sealant composition to said surface, said composition comprising a solution, in a volatile solvent, of an hydroxy functional film forming and at least 0.25 percent of a strong acid, by weight of said resin.

4,525,512

COALESCING AGENTS

Barry Hudson, Beverley, England, assignor to BP Chemicals Limited, London, England

Filed Feb. 24, 1984, Ser. No. 583,323

Claims priority, application United Kingdom, Mar. 9, 1983, 8306530

Int. Cl.³ C08K 5/09, 5/10

U.S. Cl. 524—284 **20 Claims**

1. An ester of the general formula

XR

wherein X represents the group

$$R_1—O—(R_2)_x—O—(R_3)_y—O—CO—$$

in which R_1 is a C_1–C_4 alkyl group, each of R_2 and R_3 represent the same or different straight or branched chain alkylene group, and each of x and y represent an integer from 2 to 4, and R is selected from an ethyl group, a propyl group, X, and $—C_nH_{2n}X$ wherein n is an integer between 1 and 8, and in each of which X has the same notation as above.

4,525,513

FLAME RETARDANT POLYAMIDE COMPOSITION

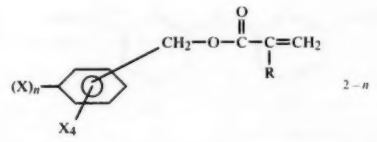
Arie Hochberg, Montclair; John C. Haylock, Sparta, and Charles D. Mason, Chatham Township, Morris County, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 27, 1982, Ser. No. 453,209

Int. Cl.³ C08K 5/10

U.S. Cl. 524—288 **22 Claims**

1. A composition comprising: from 5 to 20 weight percent of a homopolymer of a monomer having the formula



wherein

n=0 or 1, X is bromine or chlorine and R is hydrogen or methyl, said polymer having a molecular weight between 1×10^3 and 10×10^6, said molecular weight determined by gel permeation chromatography in tetrahydrofuran;

from 80 to 95 weight percent of a polyamide; and

from 0 to 10 weight percent of antimony oxide in place of a corresponding amount of polyamide.

4,525,514

STABILIZER FOR POLYMERIC SUBSTANCE AND POLYMERIC SUBSTANCE COMPOSITION CONTAINING THE SAME

Shinichi Yachigo, Toyonaka; Tamaki Ishii, Suita; Yukoh Takahashi, Toyonaka, and Yutaka Terada, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

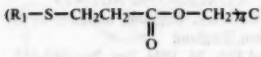
Continuation of Ser. No. 440,704, Nov. 8, 1982, abandoned. This application May 17, 1984, Ser. No. 610,941

Claims priority, application Japan, Nov. 17, 1981, 56-184865

Int. Cl.³ C08K 5/36

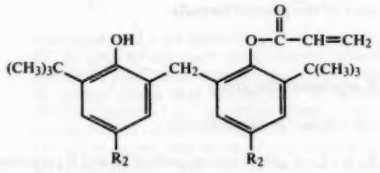
U.S. Cl. 524—291 **6 Claims**

1. A stabilizer for a polymeric substance selected from the group consisting of polybutadiene rubber, styrene-butadiene copolymer rubber, acrylonitrile-butadiene-styrene terpolymer resins and high impact polystyrene resins consisting essentially of a sulfur-containing compound of the general formula:



(I)

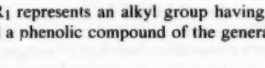
wherein R_1 represents an alkyl group having 4 to 20 carbon atoms and a phenolic compound of the general formula:



(II)

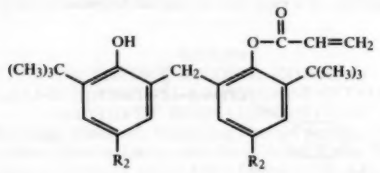
wherein R_2 represents an alkyl group having 1 to 4 carbon atoms, in the ratio (I):(II) of 1:0.1–2 by weight.

4. A polymeric substance selected from the group consisting of polybutadiene rubber, styrene-butadiene copolymer rubber, acrylonitrile-butadiene-styrene terpolymer resins and high impact polystyrene resins, said composition stabilized with a sulfur-containing compound of the general formula:



(I)

wherein R_1 represents an alkyl group having 4 to 20 carbon atoms and a phenolic compound of the general formula:



(II)

wherein R_2 represents an alkyl group having 1 to 4 carbon atoms, in the ratio (I):(II) of 1:0.1–2 by weight.

4,525,515

STORAGE-STABLE, PUMPABLE CONCENTRATED SUSPENSIONS OF WATER-SOLUBLE POLYMERS

Michel Peignier, Versailles, and Claude Renault, Le Conquet, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 25, 1983, Ser. No. 516,846
Claims priority, application France, Jul. 30, 1982, 82 13318
Int. Cl.³ C08K *5/05, 5/13;* **C08L** *5/00, 33/26*
U.S. Cl. 524—378 **17 Claims**

1. A storage-stable, pumpable, concentrated polymer suspension, comprising a suspension of (i) a particulate water-soluble polymer, in (ii) at least one water-soluble fluid surfactant having an HLB greater or equal to 10, and (iii) water, the amount of water being less than about 30% by weight of the total weight of said suspension, and the ratio by weight of said polymer (i) to said surfactant (ii) ranging from 20–90/80–10.

4,525,516

HALOGENATED ORGANIC PEROXIDES IN FLAME RETARDANT ETHYLENE POLYMER COMPOSITIONS

Rodrigo A. Garcia, Houston, Tex., and Robert J. Martinovich, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 462,849, Feb. 1, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,665
Int. Cl.³ C08K *5/14*
U.S. Cl. 524—380 **18 Claims**

1. A composition comprising:
(a) a ethylene polymer,
(b) a flame retardant system, and
(c) a chlorinated di-tertiary-alkyl peroxide;
wherein said flame retardant system is comprised of (i) at least one halogen-containing organic flame retardant selected from the group consisting of:
1,4,7,10-dimethanocycloocta-1,2,3,4,7,8,9,10,13,13,14,14-dodecachloro-1,4,4a,5,6,6a,7.10,10a,11,12,12a-dodecahydro[1,2,5,6]dibenzene and 1,2 bis(pentabromophenoxy)ethane
and (ii) antimony oxide.

4,525,517

VULCANIZABLE POLYMER COMPOSITIONS WITH IMPROVED SCORCH

Kyosaku Sato, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Feb. 13, 1984, Ser. No. 579,547
Int. Cl.³ C08K *5/04*
U.S. Cl. 524—394 **16 Claims**

1. A vulcanizable polymer composition with improved scorch comprising (1) a carboxylated nitrile rubber, said rubber being a copolymer of butadiene, acrylonitrile and one or more, α,β-unsaturated carboxylic acids selected from acrylic, methacrylic, fumaric, maleic and itaconic acids, (2) one or more polyvalent metal oxides, and (3) one or more alkali metal salts selected from the lithium, sodium and potassium salts of $C_{12\text{-}18}$-alkanoic acids.

4,525,518

CHALKING-RESISTANT, CALCINED KAOLIN CLAY PIGMENT AND METHOD OF MAKING

Edward C. Kostansek, Annandale, N.J., assignor to Engelhard Corporation, Edison, N.J.

Division of Ser. No. 326,630, Dec. 2, 1981, Pat. No. 4,427,450. This application Jan. 23, 1984, Ser. No. 546,625
Int. Cl.³ C08K *3/34*
U.S. Cl. 524—447 **2 Claims**

1. An exterior grade paint comprising an improved calcined kaolin clay pigment and film-forming binder, said improved calcined kaolin clay pigment having been obtained by a process which comprises:
(a) fractionating a hydrous clay to obtain a fine fraction having an average particle size less than about 1 micron, e.s.d., and fractionating the same or a different hydrous clay to obtain a coarse fraction having an average size above about 3 microns, e.s.d.,
(b) blending said fine fraction and said coarse fraction clay such that the resulting blend has an average particle size of at least 3 microns, e.s.d.,
(c) calcining said blended clay under conditions of time and temperature such that said hydrous kaolin clay is substantially dehydrated by passing through the characteristic kaolin endotherm, and
(d) milling said calcined blended clay without reducing average particle size below about 3 microns, e.s.d. until an oil absorption in the range of about 10–30 g. oil/100 g. clay as determined by ASTM spatulla rubout is achieved;
said calcined kaolin clay pigment bring present in said paint at a reduced pigment volume concentration below 1 and said film-forming binder being an acrylic or vinyl acrylic

resin containing globules 0.1 to 1.0 micron diameter and having a molecular weight of 10,000 to 1,000,000.

2. An exterior grade paint comprising an improved calcined kaolin clay pigment and film-forming binder, said improved kaolin clay pigment having been obtained by a process which comprises:

(a) blending coarse calcined kaolin clay particles having an average particle size above about 3 microns, e.s.d., and fine calcined kaolin clay particles having an average particle size smaller than about 1 micron, e.s.d., the resulting blend having an average particle size of at least 3 microns, e.s.d., and

(b) milling said blended particles without reducing average particle size below about 3 microns, e.s.d. until an oil absorption in the range of about 10–30 g. oil/100 g. clay as determined by ASTM spatula rubout is achieved,

said calcined kaolin pigment being present in said paint at a reduced pigment volume concentration below 1 and said film forming binder being an acrylic or vinyl acrylic resin containing globules 0.1 to 1.0 micron diameter and having a molecular weight of 10,000 to 1,000,000.

4,525,519

STABLE AMPHOTERIC LATICES OF COPOLYMERS BASED ON CONJUGATED DIENES

Frederic Leising, Vaujours, France, assignor to Rhone-Poulenc Specialites Chimiques, France

Filed Jan. 25, 1984, Ser. No. 573,726

Claims priority, application France, Jan. 28, 1983, 83 01302

Int. Cl.³ C08L *41/00*

U.S. Cl. 524—457 **32 Claims**

1. A stable amphoteric latex based on conjugated dienes, formed by:

(A) preparing an amphoteric aqueous dispersion of particles by reacting

(a) at least one unsaturated nitrogen compound capable of being hydrolyzed in an acid or alkaline medium, with

(b) a cationic aqueous emulsion mixture, containing:

(i) at least one non-ionic monomer capable of being copolymerized with said hydrolyzable unsaturated nitrogen compound to form synthetic polymers,

(ii) at least one unsaturated salt of a polycoordinated onium of a Group 5*a* or 6*a* element capable of copolymerizing with said monomers,

(iii) a cationic or non-ionic polymerization initiator, and

(iv) a cationic or non-ionic emulsifier,

the amount of said unsaturated nitrogen compound being such that the ratio of the number of anionic charges generated by said unsaturated nitrogen compound in a basic medium to the number of cationic charges of the cationic aqueous emulsion mixture in a basic medium is more than 1, and

(B) polymerizing, in said aqueous dispersion, without prior neutralization of said dispersion, at least one conjugated diene or a mixture of said conjugated diene and at least one non-ionic monomer in the presence of an initiator selected from the group consisting of an uncharged initiator and a cationic-charge-generating initiator.

4,525,520

METHOD OF PREPARING MICROCAPSULES

Shunsuke Shioi; Gensuke Matoba, both of Osaka, and Makoto Miyake, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Ltd., Japan

Filed Mar. 23, 1984, Ser. No. 592,553

Claims priority, application Japan, Mar. 28, 1983, 58-54779; Apr. 9, 1983, 58-62418; Jun. 14, 1983, 58-107423; Jan. 9, 1984, 58-3274

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—512 **20 Claims**

1. In a microencapsulation process which causes hydrophobic core material containing an oil-soluble melamine-formaldehyde precondensate to be emulsified in water or in a hydrophilic medium, and to form capsule wall film under conditions for promoting polycondensation, the process which is characterized in that said oil-soluble melamine-formaldehyde precondensate is 40 to 100% in a degree of formaldehyde substitution, 80 to 100% in alkylation degree, and 4 to 11 in hydrophobic degree.

4,525,521

COATING COMPOSITION OF AN ACRYLIC POLYMER HAVING AMINO ESTER GROUPS AND A GLYCIDYL ACRYLIC POLYMER

Herman C. DenHartog, Pontiac, and Aloysius N. Walus, Troy, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

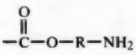
Continuation-in-part of Ser. No. 542,135, Oct. 14, 1983, abandoned. This application Jul. 27, 1984, Ser. No. 635,350

Int. Cl.³ C08L *37/00;* C08K *3/10, 5/34;* C09D *3/74*

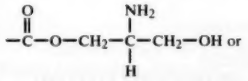
U.S. Cl. 524—517 **17 Claims**

1. A coating composition comprising 20–80% by weight of a binder and 80–20% by weight of a solvent for the binder, wherein the binder consists essentially of about:

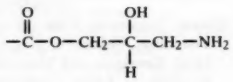
A. 60–80% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of polymerized monomers of methyl methacrylate and monomers selected from the group consisting of alkyl methacrylate and alkyl acrylate each having 2–12 carbon atoms in the alkyl group and said polymer having pending from the carbon-carbon atoms of the polymer backbone aminoester groups of the formula



where R is an alkylene group having 2–3 carbon atoms or hydroxyamino ester groups of the formula



or



B. 20–40% by weight, based on the weight of the binder, of a glycidyl acrylic crosslinking polymer of polymerized monomers having at least 60% by weight of a glycidyl constituent selected from the group consisting of glycidyl methacrylate and glycidyl acrylate and polymerized monomers selected from the group consisting of alkyl methacrylate and alkyl acrylate each having 2–12 carbon atoms in the alkyl group;

said polymer having a weight average molecular weight of about 6,000–40,000 determined by gel permeation chromatography using polymethyl methacrylate as a standard.

4,525,522

DRILLING FLUIDS BASED ON SULFONATED THERMOPLASTIC POLYMERS HAVING IMPROVED LOW TEMPERATURE RHEOLOGICAL PROPERTIES

S. Richard Turner, Bridgewater, N.J.; Thad O. Walker, Humble, Tex.; Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

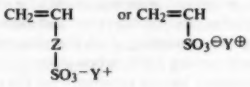
Filed Sep. 13, 1982, Ser. No. 416,935

Int. Cl.³ C08L *41/00;* C09K *3/00*

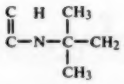
U.S. Cl. 524—547 **14 Claims**

1. An oil-based drilling mud which consisting essentially of: (a) an organic liquid substantial immiscible in water;

(b) about 1 to about 10 parts by weight of water per 100 parts by weight of the organic liquid;
(c) about 20 to about 50 lb/bbl. of an emulsifier and/or emulsifier package;
(d) weighting material necessary to achieve the desired density; and
(e) about 0.5 to about 20.0 lb/bbl. which is equivalent to 0.15 to 6 lb/bbl said polymer derived from the latex of a water insoluble and oil insoluble neutralized sulfonate-containing styrene polymer, said neutralized sulfonated thermoplastic polymer having about 5 to about 100 meq. of sulfonate groups per 100 grams of the neutralized sulfonate-containing styrene polymer, said latex containing about 20.0 to about 50.0 weight percent of the neutralized sulfonate-containing styrene polymer, said sulfonated polymer being located at oil/water interface of said drilling mud, said sulfonated polymer having about 5 to about 100 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonated polymer being formed the polymerization of a water soluble monomer and a monomer characterized by the formula:



wherein Z is ϕ or



and $Y\oplus$ is a cation selected from the group consisting of Groups IA, IIA, IB and IIB of the Periodic Table and an amine.

4,525,523

NEGATIVE-WORKING PHOTORESIST COATING COMPOSITION

Hatsuo Nakamura; Tiharu Kato, both of Yokohama; Toshio Yonezawa, Yokosuka; Shigeo Koguchi, Kitakyushu; Kiyoto Mori, Kasukabe, and Masahiko Igarashi, Soka, all of Japan, assignors to Kanto Chemical Co., Inc., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Aug. 26, 1983, Ser. No. 526,820
Claims priority, application Japan, Aug. 31, 1982, 57-150022
Int. Cl.[3] C08L *9/00*
U.S. Cl. 524—572 **8 Claims**

1. A negative-working photoresist coating composition comprising a cyclized polyisoprene having a weight-average molecular weight of 10,000 to 100,000 and a molecular weight distribution of not more than 1.9, an organic solvent of the cyclized polyisoprene, and a bisazido compound as a crosslinking agent.

4,525,524

POLYESTER COMPOSITION

William C. T. Tung, Tallmadge, and George A. Deisz, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1984, Ser. No. 600,862
Int. Cl.[3] C08L *67/02*
U.S. Cl. 524—601 **18 Claims**

1. A liquid system comprised of:
(A) a water/alcohol solvent comprised of from 50 to 80 weight percent water and from 20 to 50 weight percent of at least one alcohol having from 3 to 5 carbon atoms; and
(B) a polyester comprised of repeat units which are derived from (a) a diacid component which is comprised of (1) from 20 to 90 mole percent of at least one member selected from the group consisting of dimethylterephthalate and terephthalic acid, (2) from 1 to 6 mole percent of at least one salt of an organic sulfonic acid monomer, and (3) from 4 to 74 mole percent of at least one member selected from the group consisting of alkyl dicarboxylic acids having from 4 to 36 carbon atoms, diesters of alkyl dicarboxylic acids having from 6 to 36 carbon atoms, aryl dicarboxylic acids having from 9 to 20 carbon atoms, diesters of aryl dicarboxylic acids having from 11 to 22 carbon atoms, alkyl substituted aryl dicarboxylic acids having from 9 to 22 carbon atoms, diesters of alkyl substituted aryl dicarboxylic acids having from 11 to 20 carbon atoms, dimethylorthophthalate, dimethylisophthalate, orthophthalic acid, and isophthalic acids; and (b) a diol component which is comprised of (1) from 20 to 100 mole percent ethylene glycol, and (2) from 0 to 80 mole percent of one or more member selected from the group consisting of glycols having from 3 to 12 carbon atoms; wherein said polyester is terminated with carboxyl end groups and wherein said liquid system has a pH of at least 7.

4,525,525

USE OF BIS-SEMIESTERS OF SULFOSUCCINIC ACID WITH POLYETHER DIOLS BASED ON ETHYLENE OXIDE/PROPYLENE OXIDE OR THEIR SALTS AS SURFACE-ACTIVE AGENTS

Rainer Höfer, Duesseldorf, and Bernhard Bartnick, Monheim-Baumberg, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft (Henkel KGaA), Duesseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,087
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311601
Int. Cl.[3] C08K *5/41;* **C08L** *25/06*
U.S. Cl. 524—742 **17 Claims**

1. A process for reducing the surface tension of an aqueous medium which comprises adding to said medium an effective amount of at least one compound selected from the group consisting of (a) a bis-semiester of sulfosuccinic acid with a polyether diol based on ethylene oxide and propylene oxide; (b) an alkali metal salt of such bis-semiester; and (c) the ammonium salt of such bis-semiester.

4,525,526

SURFACE ACTIVE POLYMERIC SURFACTANTS CONTAINING SIDE CHAIN HYDROPHOBES

Ritchie A. Wessling, Midland, and Dale M. Pickelman, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 539,451, Oct. 6, 1983, , which is a division of Ser. No. 272,435, Jun. 10, 1981, Pat. No. 4,426,489, which is a division of Ser. No. 123,321, Feb. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 901,924, May 1, 1978, abandoned. This application Nov. 23, 1983, Ser. No. 554,510
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.[3] C08F *26/00*
U.S. Cl. 524—815 **3 Claims**

1. A method of reducing the surface tension of an aqueous medium having a polymeric surfactant dissolved therein, said polymeric surfactant (a) being a substantially linear, synthetic, water-soluble cationic interpolymer having a critical micelle concentration of 0.01 to about 10 percent in water at 25° C., a charge density of from about 1 to about 5 meq/g and a number average molecular weight of from about 500 to about 40,000; (b) being derived from the addition polymerization of one or

more ethylenically unsaturated monomers and (c) being composed of a plurality of nonionic hydrophobic units and a plurality of pH independent hydrophilic cationic units which are randomly distributed in the backbone of said interpolymeric surfactant; said method comprising the use of the aforementioned type of polymeric surfactant in which a portion of the randomly distributed cationic units thereof contains a hydrophobic substituent thereon, said hydrophobic substituent being an aralkyl group of from 8 to about 20 carbon atoms and said portion of such cationic groups which is so substituted being such that an average of from 1 to about 5 of such hydrophobically substituted cationic groups are present per polymeric surfactant molecule.

4,525,527

PRODUCTION PROCESS FOR HIGHLY WATER ABSORBABLE POLYMER

Hisao Takeda, Zama, and Yasunori Taniguchi, Samukawamachi, both of Japan, assignors to American Colloid Company, Skokie, Ill.

Filed Jan. 21, 1983, Ser. No. 460,037

Claims priority, application Japan, Jan. 25, 1982, 57-8983; Mar. 9, 1982, 57-035913; Mar. 9, 1982, 57-035914

Int. Cl.³ C08F *220/06*

U.S. Cl. 524—831 **27 Claims**

1. A method of manufacturing a composition comprising mixing a monomer solution of (A) acrylic acid, neutralized 70 to 100 mole percent, (B) acrylamide in a mole ratio of (A):(B) in the range of 70:30 to 90:10; (C) a water soluble or water miscible polyvinyl monomer cross-linking agent in an amount of 0.001 to 0.3 percent by weight of (A) plus (B); and water to form a mixed monomer solution, wherein the monomers of the mixed monomer solution consist essentially of (A), (B) and (C) and the monomer concentration is at least 70 percent by weight of the monomer solution prior to polymerization initiation; and initiating polymerization of monomers (A) and (B) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to form a water absorbing cross-linked polyacrylate resin composition having a water content of 15 percent by weight or less.

4,525,528

PEROXIDE-CURABLE FLUOROSILICONE COPOLYMER COMPOSITIONS

Richard B. Bush, Schenectady, and Edwin R. Evans, Saratoga, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,491

Int. Cl.³ C08L *83/04*

U.S. Cl. 524—860 **19 Claims**

1. A peroxide-curable silanol-endstopped or alkenyl-endstopped diorganopolysiloxane copolymer having a molecular weight of from about 400,000 to about 600,000 comprising units of the formulae $RR'SiO$ and R''_2SiO, wherein R is fluoroalkyl of from 3 to 8 carbon atoms, R' is alkyl of from 1 to 8 carbon atoms, alkenyl of from 2 to 8 carbon atoms, or phenyl, and wherein sufficient $RR'SiO$ units are present to provide about 45–65 mole percent fluorosilicone content and sufficient R''_2SiO units containing alkenyl substituents are present to provide a vinyl content along the polysiloxane chain of about 0.02 weight percent to about 0.5 weight percent as $CH_2{=}CH{-}$.

4,525,529

POLYESTER RESIN COMPOSITION

Yasuhiro Ohmura, Kawasaki; Seiichiro Maruyama, and Shigeru Shigemoto, both of Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

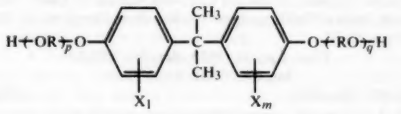
Filed Aug. 31, 1982, Ser. No. 413,555

Claims priority, application Japan, Sep. 17, 1981, 56-146615; Sep. 18, 1981, 56-147580

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—64 **9 Claims**

1. A polyester resin composition comprising (a) 100 parts by weight of a copolymeric polyester resin containing from 3% to 15% by weight halogen which is derived from terephthalic acid or ester forming derivative thereof, an alkylene glycol having 2 to 10 carbon atoms or ester forming derivative thereof, and a halogen-containing aromatic diol of the formula:



wherein R is an alkylene group having 2 to 4 carbon atoms, X is a halogen atom, l and m are each an integer of 1 to 4, and p and q are each an integer of 1 to 10, and

(b) from 0.5 to 15 parts by weight of a modified ethylene copolymer consisting essentially of a copolymer of at least 50 mole % ethylene and an α-olefin having at least 3 carbon atoms, said ethylene/α-olefin copolymer being modified by graft polymerization with an α,β-unsaturated carboxylic acid or derivative thereof in an amount of from 0.05% to 1.5% by weight based on the weight of the copolymer.

4,525,530

THERMOPLASTIC RESIN COMPOSITIONS

Sigemi Mathumoto, Takasago; Hidetaka Kubota, and Fumiya Nagoshi, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 271,204, Jun. 8, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,433

Claims priority, application Japan, Jun. 28, 1980, 55-88398

Int. Cl.³ C08L *51/04, 55/02*

U.S. Cl. 525—84 **1 Claim**

1. A thermoplastic resin composition which comprises 20–70 parts by weight of a polyvinyl chloride resin and 80–30 parts by weight of a mixed composition of the following copolymers (A) and (B) at the following mixing ratio:

(A) 90–50% by weight of a copolymer which is the polymerization product of 65–90 parts by weight of α-methylstyrene with 35–10 parts by weight of acrylonitrile and 0–5 parts by weight of a copolymerizable vinyl monomer or monomers, 30 parts by weight or more of said copolymer having polymer chain units with an α-methylstyrene content of 82% by weight or higher; and

(B) 10–50% by weight of a graft copolymer obtained by reacting 35–80 % by weight of a conjugated diene rubber and 65–20% by weight of a monomer or monomers comprising a monovinyl aromatic compound, an unsaturated nitrile compound or an alkyl methacrylate,

wherein copolymer (A) is prepared by the following steps comprising:

charging 65 parts by weight or more of α-methylstyrene and 10 parts by weight or less of acrylonitrile and/or copolymerizable vinyl monomer other than α-methylstyrene into the reactor all at once,

emulsifying the reactants, and

emulsion polymerizing the emulsified monomers while continuously and gradually adding at least 10 and up to 35 parts by

weight of acrylonitrile and 15% or less, based on the acrylonitrile, of the copolymerizable vinyl monomer, wherein the weight ratio of α-methylstyrene to monomers other than α-methylstyrene in the reaction system is maintained at 90/10 or higher until the resultant copolymer reaches 40 parts by weight, based on 100 parts by weight of the resulting copolymer.

4,525,531

POLYMERIC COMPOSITIONS SUITABLE FOR USE IN THE MEDICAL FIELD AND CONTAINING A POLYOLEFIN, A POLYSILOXANE AND AN ELASTOMER

Mimzee Zukosky, Redwood City, and Ronald L. Dieck, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 26, 1983, Ser. No. 488,861

Int. Cl.³ C08L *9/06, 53/02*

U.S. Cl. 525—92 **2 Claims**

1. A polymeric composition which comprises

(a) 12 to 40% by weight of a thermoplastic polymer comprising units derived from an olefin,

(b) 1 to 10% by weight of a polymer which is solid at room temperature and which is a block copolymer comprising polysiloxane blocks and at least 10% by weight of polycarbonate blocks, and

(c) 48 to 88% by weight of a styrene-butadiene elastomer having a Shore D Hardness of less than 60,

the amounts of components (a), (b) and (c) being by weight, based on the total weight of (a), (b) and (c).

4,525,532

IMPACT RESISTANT α-METHYLSTYRENE-STYRENE COPOLYMER BLENDS

Lu H. Tung; Grace Y. Lo, and Jerald A. Griggs, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1983, Ser. No. 525,335

Int. Cl.³ C08L *53/02*

U.S. Cl. 525—98 **7 Claims**

1. A copolymer blend suitable for impact resistant moldings, the blend consisting essentially of a copolymer of an alkenyl aromatic monomer and an isopropenyl aromatic monomer wherein the ratio of isopropenyl aromatic monomer to alkenyl aromatic monomer is from about 1 to 99 to 99 to 1 in admixture with a member selected from a group consisting of

(1) an AB block copolymer

(2) an ABA block copolymer

(3) an $AB(BA)_n$ block copolymer

and mixtures thereof wherein n is an integer of from about 2 to 10; A represents a block of an alkenyl aromatic monomer-isopropenyl aromatic monomer copolymer; B is a block of conjugated diene elastomer; the A blocks having a ratio of isopropenyl aromatic monomer to alkenyl aromatic monomer of from about 1 to 99 to 99 to 1 by weight, the molecular weight of the copolymer being from about 50,000 to 1,000,000, the block copolymers containing from about 10 to 90 weight percent of a diene elastomer selected from the group consisting of polybutadiene, polyisoprene and copolymers of butadiene and isoprene wherein the 1,2-vinyl content is from about 8 to 50 weight percent; the block copolymers having a molecular weight of from about 30,000 to about 800,000.

4,525,533

POLYMER COMPOSITIONS

Jean-Noel Bertrand, Wezembeek Oppem, and Jean Castelein, Mellery, both of Belgium, assignors to Montefina, S.A., Belgium

Filed Mar. 27, 1984, Ser. No. 593,230

Claims priority, application Luxembourg, Mar. 29, 1983, 84720

Int. Cl.³ C08L *53/02*

U.S. Cl. 525—98 **7 Claims**

1. A polymer composition comprising from about 30% to about 50% by weight of polystyrene, from about 30% to about 64% by weight of polypropylene and from about 6% to about 30% by weight of a sequenced radial type copolymer having a molecular weight not lower than about 100,000 wherein said radial type copolymer comprises from about 50% to about 70% by weight of conjugated diene and from about 30% to about 50% by weight of styrene.

4,525,534

POLYAMINES AND A SINGLE-STAGE PROCESS FOR THE PRODUCTION THEREOF

Werner Rasshofer, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,367

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227219

Int. Cl.³ C08G *18/08, 18/10*

U.S. Cl. 525—127 **13 Claims**

1. A single stage process for the production of primary polyamines containing aromatic and/or aliphatic amino groups comprising hydrolyzing a mixture of

(a) an isocyanate group containing compound having an NCO-content of from 0.5 to 40 wt %,

(b) water,

(c) a basic compound which is substantially insoluble in water and organic solvents, and

(d) a water-miscible solvent.

4,525,535

AQUEOUS GLYCOLURIL THERMOSETTING COATING

Gary P. Craun, Wickliffe, and Henry J. DeGraaf, Stow, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,596

Int. Cl.³ C08L *61/24*

U.S. Cl. 525—163 **6 Claims**

1. A surface coating composition containing a polymeric binder, the binder comprising on a weight basis:

between about 2% and 50% hydroxylated polyester containing two or more hydroxyl groups per molecule and having a molecular between 200 and 1,000, and between 0% and 90% emulsion polymer, said emulsion polymer being emulsion copolymerized ethylenic monomers, and about 2 to 50% glycoluril, said binder composition being heat curable and thermosetting to form a cured coating film.

4,525,536

HEAT RESISTANT RESIN COMPOSITION

Sadao Ikuma, Suzuka; Yuji Aoki, Yockaichi, and Noboru Watanabe, Matsudo, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,111

Claims priority, application Japan, Jun. 21, 1982, 57-106553

The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.

Int. Cl.³ C08L *25/12, 33/24, 35/06*

U.S. Cl. 525—194 **7 Claims**

1. A heat resistant resin composition comprising from 10 to 90% by weight of a copolymer A and from 90 to 10% by weight of a copolymer B, in which the copolymer A is composed of an N-aromatic maleimide monomer residue, a maleimide monomer residue wherein the N atom of said maleimide

is bonded to a hydrogen atom, a vinyl aromatic monomer residue and, optionally an other vinyl monomer residue, the total content of the N-aromatic maleimide monomer residue and the maleimide monomer residue being from 10 to 45%, the content of the N-aromatic maleimide monomer residue being greater than the content of the maleimide monomer residue, the content of the vinyl aromatic monomer residue being from 90 to 55% and the content of said other vinyl monomer residue being from 0 to 20%, and the copolymer B is composed of a vinyl cyanide monomer residue, a vinyl aromatic monomer residue and, optionally an other vinyl monomer residue, the content of the vinyl cyanide monomer residue being from 20 to 55%, the content of the vinyl aromatic monomer residue being from 80 to 45% and the content of said other vinyl monomer residue being from 0 to 20%.

4,525,537

METHACRYLIC RESIN SHAPED ARTICLE, PROCESS FOR PRODUCING THE SAME AND PROCESS FOR PRODUCING A SHAPED ARTICLE HAVING A MAT SURFACE FROM SAID RESIN SHAPED ARTICLE

Kazumasa Kamada, Hiroshima; Katsumi Tamai; Kazunori Abe, Ohtake, and Yoshinobu Shiraishi, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,439

Claims priority, application Japan, Jun. 3, 1982, 57-95524

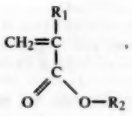
Int. Cl.³ C08L *33/12*

U.S. Cl. 525—198 **21 Claims**

1. A methacrylic resin shaped article made of a composition which comprises [A] 80 to 99.9% by weight of a polymer which forms a continuous phase and [B] 0.1 to 20% by weight of a polymer which forms a dispersed phase,

said polymer [A] being a polymer obtained from methyl methacrylate alone or from a polymerizable unsaturated monomer mixture containing 80% by weight or more of methyl methacrylate,

said polymer [B] being a polymer obtained from at least one polymerizable unsaturated monomer represented by the general formula [I]



[I]

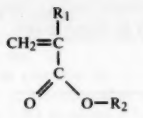
wherein R_1 represents a hydrogen atom or methyl group, and R_2 represents a hydrocarbon radical having at least 2 carbon atoms or a derivative thereof, or obtained from a polymerizable unsaturated monomer mixture containing 50% by weight or more of at least one polymerizable unsaturated monomer represented by the above general formula [I], and the refractive index (n_A) of said polymer [A] and the refractive index (n_B) of said polymer [B] satisfying the following relation:

$$0.998 \leqq n_B/n_A \leqq 1.002.$$

7. A process for producing a methacrylic resin shaped article made of a composition which comprises, for the purpose of producing a methacrylic resin comprising [A] 80 to 99.9% by weight of a polymer which forms a continuous phase and [B] 0.1 to 20% by weight of a polymer which forms a dispersed phase, and the refractive index (n_A) of the resulting polymer [A] and the refractive index (n_B) of said polymer [B] being selected so as to satisfy the following relation:

$$0.998 \leqq n_B/n_A \leqq 1.002$$

dissolving or dispersing, as the said polymer [B], a polymer obtained from at least one polymerizable unsaturated monomer represented by the general formula [I]



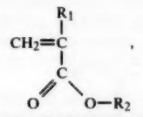
[I]

wherein R_1 represents a hydrogen atom or methyl group and R_2 represents a hydrocarbon radical having at least 2 carbon atoms or a derivative thereof, or obtained from a polymerizable unsaturated monomer mixture containing 50% by weight or more of a polymerizable unsaturated monomer of the above formula [I], into methyl methacrylate monomer, or a partially polymerized methyl methacrylate monomer, or a polymerizable unsaturated monomer mixture containing 80% by weight or more of methyl methacrylate, or a partially polymerized product of said methyl methacrylate monomer mixture, which are to form the said polymer [A], polymerizing the resulting solution or dispersion in the presence of a radical polymerization initiator to form a shaped article.

13. A process for producing a methacrylic resin shaped article having a mat surface which comprises stretching a methacrylic resin shaped article having a latent mat surface at a temperature above the heat distortion temperature of said shaped article, which methacrylic resin shaped article comprising [A] 80–99.9% by weight of a polymer which forms a continuous phase and [B] 0.1 to 20% by weight of a polymer which forms a dispersed phase,

said polymer [A] being a polymer obtained from methyl methacrylate alone or from a polymerizable unsaturated monomer mixture containing 80% by weight or more of methyl methacrylate,

said polymer [B] being a polymer obtained from at least one polymerizable unsaturated monomer represented by the general formula [I]



[I]

wherein R_1 represents a hydrogen atom or methyl group and R_2 represents a hydrocarbon radical having at least 2 carbon atoms or a derivative thereof, or obtained from a polymerizable unsaturated monomer mixture containing 50% by weight or more of at least one polymerizable unsaturated monomer represented by the general formula [I] mentioned above, and the refractive index (n_A) of said polymer [A] and the refractive index (n_B) of said polymer [B] satisfying the following relation:

$$0.998 \leqq n_B/n_A \leqq 1.002.$$

4,525,538

POLYMERIZING MONOMER IN PRESENCE OF POLYMER CONTAINING ELECTROPHILIC MOIETY USING ZIEGLER-NATTA CATALYST

Gregory L. Baker, Bridgewater, and Frank S. Bates, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 18, 1983, Ser. No. 485,856

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—275 **10 Claims**

1. A process of polymerization comprising the steps of polymerizing a composition comprising a monomer having an unsaturated bond with a Ziegler-Natta catalyst characterized in that

a host polymer is contacted with said polymerizing composition at a time which allows the reaction of said host polymer with said polymerizing monomer before the completion of said polymerization wherein said host polymer includes a graft site that comprises an electrophilic moiety

that reacts through nucleophilic attack with said polymerizing monomer, wherein said electrophilic moiety comprises a carbonyl or an epoxy group.

4,525,539

VULCANIZABLE NITRILE-CONTAINING PERFLUOROELASTOMER

Andrew E. Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 2, 1982, Ser. No. 446,227

Int. Cl.³ C08F *220/70, 220/42, 8/32, 8/34*

U.S. Cl. 525—326.3 **10 Claims**

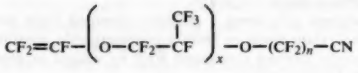
1. A vulcanizable perfluoroelastomer composition comprising

(a) a copolymer consisting essentially of copolymerized units of:

(1) 53–79.8 mole percent tetrafluoroethylene,

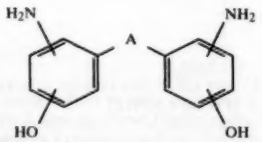
(2) 20–45 mole percent perfluoromethyl perfluorovinyl ether and

(3) 0.2–2 mole percent of a cure site monomer of the formula:

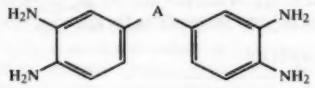


where n = 1–4 and x = 1–2, and

(b) 0.5–5.0 parts by weight per 100 parts by weight of the copolymer of a vulcanizing agent selected from the group consisting of bisaminophenols of the formula



and tetraamines of the formula



where A is SO_2, O, CO, alkyl of 1–6 carbon atoms, perfluoroalkyl of 1–10 carbon atoms, or a carbon-carbon bond linking the two aromatic rings.

4,525,540

CYCLIC ESTER DIENES, POLYMERIC AND OTHER DERIVATIVES THEREOF

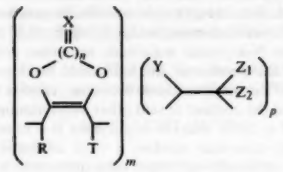
Boris Weinstein, and Edward Orton, both of Seattle, Wash., assignors to Washington Research Foundation, Seattle, Wash.

Filed Jan. 28, 1983, Ser. No. 461,706

Int. Cl.³ C08F *224/00*

U.S. Cl. 525—327.2 **2 Claims**

1. A polymer having the formula:



wherein:

n is 1 or 2;

X is sulfur when n is 1 and oxygen when n is 1 or 2; and

R and T are the same or different, being hydrogen, a hydrocarbyl group having from 1 to 12 carbon atoms, or a 1 to 6 heteroatom substituted hydrocarbyl group having from 1 to 12 carbon atoms, wherein said heteroatoms are chalcogen, halogen, or nitrogen;

m is at least 1 and when m is 1, p is at least 2;

p is 0 or greater, and m + p are two or greater;

Z_1 and Z_2 are the same or different, being hydrogen, halogen, acyloxy of from 1 to 3 carbon atoms; alkoxy of from 1 to 3 carbon atoms, hydrocarbyl, carboxy, cyano, or carboalkoxy wherein the alkoxy group is from 1 to 3 carbon atoms; and

Y is hydrogen or taken together with Z_1 and the ethylene to which they are attached to form a maleic anhydride group.

4,525,541

METHOD FOR MODIFYING RUBBERS

Shizuo Kitahara, Kawaguchi, and Nagatoshi Sugi, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

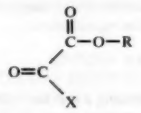
Filed Jun. 22, 1983, Ser. No. 506,875

Claims priority, application Japan, Jun. 29, 1982, 57-112145; Mar. 7, 1983, 58-37159

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—337 **28 Claims**

1. A method for modifying a rubber, which comprises reacting a rubber having an unsaturated carbon bond with an organic compound represented by the general formula



wherein —R represents a hydrocarbon group and —X represents —H, —CN or

in which Y represents $—R_1$, $—OR_2$ or $—NR_3R_4$, in which R_1, R_2, R_3 and R_4 are hydrocarbon groups,

in the presence of a Lewis acid to introduce an ester group of the organic compound into the rubber by an addition reaction.

4,525,542
NOVOLAC BASED EPOXY RESIN CURING AGENTS FOR USE IN SOLVENT

William J. DeGooyer, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,582
Int. Cl.[3] C08L *63/04*
U.S. Cl. 525—484 **16 Claims**

1. A novolac based epoxy resin curing agent comprising the reaction product of an epoxy novolac compound, a primary amine containing polyamine and a monoepoxide, wherein substantially all of the epoxy groups are reacted with the polyamines and wherein at least substantially all of the unreacted primary amine groups in the polyamine/epoxide reaction product groups are further reacted with the monoepoxide.

4,525,543
EPOXY-FREE HYDROXY-FUNCTIONAL POLYETHER BASED ON OLEYL ALCOHOL AND SOLVENT-SOLUBLE COPOLYMERS CONTAINING THE SAME

Kazys Sekmakas, Palatine, and Edward J. Murphy, Mount Prospect, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 935,505, Aug. 21, 1978, abandoned, which is a continuation of Ser. No. 548,680, Feb. 10, 1975, abandoned. This application Mar. 26, 1979, Ser. No. 24,052
Int. Cl.[3] C08G *59/14*; C08L *63/02*
U.S. Cl. 525—529 **3 Claims**

1. An organic solvent-soluble copolymer of 20%–60% by weight of an epoxy-free hydroxy functional polyether reaction product of a diglycidyl ether of a bisphenol having a molecular weight of about 1000 with a stoichiometric proportion of oleyl alcohol, based on the oxirane functionality of said diglycidyl ether, with monoethylenically unsaturated monomers copolymerizable therewith, said monomers including carboxyl functional monomer providing the copolymer with an acid number in the range of 12–60, said copolymer being formed by copolymerization in organic solvent solution.

4,525,544
VINYL ESTER RESIN COMPOSITION

Donald L. Nelson, and Mary H. Lamont, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 12, 1982, Ser. No. 367,643
Int. Cl.[3] C08F *283/10*; C08G *59/16*
U.S. Cl. 525—531 **30 Claims**

1. A vinyl ester resin obtained by reacting

(A) at least one epoxy resin having an average of more than one glycidyl ether group per molecule; and

(B) a product resulting from a reaction of

(1) the reaction product of

(a) at least one α,β-ethylenically unsaturated acid containing 4 or 5 carbon atoms per molecule, anhydrides thereof, isomers thereof or mixtures thereof;

(b) at least one unsaturated hydrocarbon selected from

(i) dienes having from about 9 to about 12 carbon atoms;

(ii) oligomers or cooligomers of dienes having from 4 to 6 carbon atoms optionally containing minor amounts of mono-olefins having from about 4 to about 6 carbon atoms; or

(iii) mixtures thereof; and

(c) if (B-1-a) contains an anhydride, from about 0.4 to about 3 moles of water per mole of anhydride; with

(2) a vicinal monoepoxide; and optionally

(3) up to about 10 percent by weight of the combined weight of (B-1) and (B-2) of a suitable isomerization catalyst for component (B-1-a); optionally

(C) up to about 0.75 mole per epoxy equivalent contained in components (A) of a polymerizable ethylenically unsaturated monocarboxylic acid; and optionally

(D) up to about 0.4 moles per epoxy equivalent contained in component (A) of maleic anhydride, citraconic anhydride or mixtures thereof; and

wherein components (A) and (B) are present in an amount which provides an epoxy equivalent to carboxyl equivalent ratio of from about 0.8:1 to about 2:1; components (B-2) and (B-1-a) are employed in an amount which provides from about 0.01 to about 0.6 moles of vicinal monoepoxide per mole of acid and/or anhydride; and component (B-1-b) is employed in an amount which provides from about 0.4 to about 1.5 moles per mole of component (B-1-a).

4,525,545
HOMOGENIZER PROCESS FOR FORMING EMULSION/SUSPENSION POLYMERS

Chung H. Wei, Wilmington, Del., assignor to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 920,599, Jun. 29, 1978, abandoned. This application Jul. 13, 1981, Ser. No. 282,630
Int. Cl.[3] C08F *2/18*
U.S. Cl. 526—65 **5 Claims**

1. In an aqueous, emulsion/suspension polymerization process for forming polymeric materials comprising at least one initial emulsion polymerization reaction of monomer in water to form a rubbery polymer and at least one subsequent suspension polymerization process in which the rubbery emulsion polymerization product is used as a reaction ingredient in a reaction mixture which also comprises at least one monomer adapted to form a rigid polymer, wherein the improvement comprises the mechanical homogenization of the monomer adapted to form said rubbery polymer in water prior to said emulsion polymerization process.

4,525,546
PROCESS FOR PRODUCING POLYETHYLENE AND AN ETHYLENE-α-OLEFIN COPOLYMER

Isaburo Fukawa, Fuji, and Kazutoshi Sato, Kurashiki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1983, Ser. No. 552,564
Claims priority, application Japan, Nov. 29, 1982, 57-207762; Nov. 30, 1982, 57-208490; Jan. 11, 1983, 58-1746; Jan. 11, 1983, 58-1748; Sep. 13, 1983, 58-167524
Int. Cl.[3] C08F *6/02, 10/02*
U.S. Cl. 526—68 **8 Claims**

1. A process for producing polyethylene or an ethylene-α-olefin copolymer, which comprises polymerizing ethylene or a mixture of ethylene with an α-olefin having 3 to 18 carbon atoms by use of a coordination polymerization catalyst containing a transition metal compound and an organo-metallic compound at an average polymerization temperature of 130° C. or more, deactivating said catalyst by adding a copolymer of at least one monomer selected from the group consisting of vinyl monomers having a carbonyl group represented by the formula:

$$CH_2=\underset{\displaystyle R^1}{\overset{|}{C}}-\underset{\displaystyle O}{\overset{\|}{C}}OR^2 \quad \text{or} \quad CH_2=\underset{\displaystyle R^1}{\overset{|}{C}}-O\underset{\displaystyle O}{\overset{\|}{C}}R^2 \quad \text{or} \quad (CH_2=\underset{\displaystyle R^1}{\overset{|}{C}}-\underset{\displaystyle O}{\overset{\|}{C}}O)_mM$$

wherein R^1 represents a hydrogen atom or a hydrocarbon group having 1 to 5 carbon atoms; R^2 is a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms; M represents a metal element; and m represents the valence of M,

or maleic anhydride with ethylene to be mixed with said catalyst, the number of carbonyl groups in the deactivator being 0.4 to 20-fold of the total number of molecules of the transition metal compound and the organo-metallic compound, separating unaltered monomers from the polymer mixture, and recycling the recovered monomers to the polymerization zone.

4,525,547

PROCESS FOR PRODUCING ETHYLENE COPOLYMER BY GASEOUS PHASE COPOLYMERIZATION

Akifumi Kato, Ohtake; Junichi Yoshida, Iwakuni, and Ryoichi Yamamoto, Waki, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 497,439, May 27, 1983, abandoned, which is a continuation of Ser. No. 310,925, Oct. 13, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 594,957

Claims priority, application Japan, Oct. 15, 1980, 55-142938

Int. Cl.³ C08F *2/34*

U.S. Cl. 526—68 **5 Claims**

1. In a gaseous phase polymerization process for producing an ethylene copolymer having a density of from about 0.923 to about 0.943 g/cc which comprises polymerizing a predominant amount of ethylene and a minor amount of an alpha-olefin having 4 to 10 carbon atoms at a temperature of from room temperature to about 130° C. and below the melting point of the copolymer formed and a pressure of from 1 to 100 $kg/cm^2.G$ in the presence of a catalyst composed of (A) a transition metal catalyst component and (B) an organometallic compound of a metal of Groups I to III of the periodic table; the improvement wherein the copolymerization is carried out under the following conditions (i) and (ii),

(i) at least 1 mole, per mole of ethylene, of a gaseous saturated hydrocarbon having 3 to 6 carbon atoms is caused to be present in the gaseous phase copolymerization system, and

(ii) the gaseous mixture containing the unreacted olefin which has been discharged from the gaseous phase copolymerization system is cooled to a temperature at which the mixture is not liquefied, and the cooled gaseous mixture is recycled to the gaseous phase copolymerization system.

4,525,548

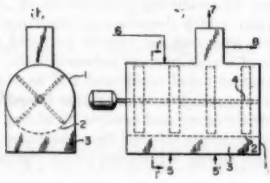
METHOD FOR VAPOR PHASE POLYMERIZATION OF OLEFINS

Kunimichi Kubo, Tokyo; Mamoru Yoshikawa; Motokazu Watanabe, both of Kawasaki; Yasunosuke Miyazaki, Machida, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company Limited, Nishi, Japan

Division of Ser. No. 242,308, Mar. 10, 1981, Pat. No. 4,372,919. This application Aug. 9, 1982, Ser. No. 406,435

Int. Cl.³ C08F *2/34*

U.S. Cl. 526—72 **7 Claims**



1. A method for vapor phase polymerization of olefins which comprises:

feeding an olefin gas into a horizontal cylindrical vessel, having a lower curved surface formed by a perforated plate which is an arc of a circle defined by an angle of from 30 to 180 degrees from the center of said cylindrical vessel, said plate extending substantially the length of said vessel and having a multiplicity of holes which have a diameter in the range of from 0.5 to 5 mm spaced at intervals in the range of from 0.5 to 50 mm, through said plate from an olefin feed chamber mounted below and covering said plate;

feeding a polymer catalyst into said horizontal cylindrical vessel through a polymerization inlet port located in a portion of said vessel other than said lower curved surface formed by said perforated plate;

reacting said olefin in the presence of said catalyst with agitation to form polymer;

removing unreacted olefin through an unreacted olefin discharge port located in a portion of said vessel other than said lower curved surface formed by said perforated plate; and

removing said polymer through a polymer outlet port located in a portion of said vessel other than said lower curved surface formed by said perforated plate.

4,525,549

PROCESS FOR PREPARING CONJUGATE DIOLEFINS, AND MEANS SUITABLE FOR THIS PURPOSE

Antonio Carbonaro, Milan, and Domenico Ferraro, S. Donato Milanese, both of Italy, assignors to Enoxy Chimica S.p.A., Milan, Italy

Filed Apr. 14, 1983, Ser. No. 484,956

Claims priority, application Italy, Apr. 15, 1982, 20746 A/82

Int. Cl.³ C08F *5/52*

U.S. Cl. 526—92 **14 Claims**

1. A catalytic system for polymerizing or copolymerizing conjugate diolefins prepared from:

(a) at least one compound of a metal of Group III B of the periodic system;

(b) at least one aluminium compound of formula AlR R', where r is alkyl, cycloalkyl or alkylaryl, and R' is R or H;

(c) water and optionally

(d) an inorganic compound containing Cl or Br in ionizable form, or at least one organic halogen derivative of formula:

where R_1, R_2 and R_3, which can be either different from each other or entirely or partly equal to each other, are H, O, Cl or Br atoms, or alkyl, aryl, alkylaryl, chloro or bromo alkyl, alkoxy or cycloalkoxy residues, and X is Cl or Br.

4,525,550

PREPARATION OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOOLEFINS USING A ZIEGLER CATALYST SYSTEM

Volker Warzelhan, Weisenheim, and Wolfgang Ball, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,446

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242149

Int. Cl.³ C08F *4/64, 10/00*

U.S. Cl. 526—116 **2 Claims**

1. A process for the preparation of homopolymers and copolymers of C_2–C_8-α-monoolefins, by polymerization of the monomer or monomers at from 30° to 200° C., and under a pressure of from 0.1 to 200 bar, using a Ziegler catalyst system comprising

(1) a transition metal catalyst component and

(2) an organoaluminum catalyst component of the formula

$$AlR_mX_{3-m}$$

where X is a radical OR, chlorine, bromine or hydrogen, R is a C_1–C_{18}-hydrocarbon radical and m is a number from 1 to 3, with the provisos (i) that the atomic ratio of the transition metal from the catalyst component (1) to aluminum from catalyst component (2) is from 1:0.1 to 1:500, and (ii) that the transition metal catalyst component

(1) used is a solid-phase product (VI), obtained by a method in which

(1.1) first

(1.1.1) a finely divided, porous, inorganic oxidic substance (I), which has a particle diameter of from 1 to 1,000 μm, a pore volume of from 0.3 to 3 cm^3/g and a specific surface area of from 100 to 1,000 m^2/g and is of the formula $SiO_2.aAl_2O_3$-where a is a number from 0 to 2, and

(1.1.2) a solution (II), as obtained on combining

(II*a*) 100 parts by weight of an alcohol of the formula

Z—OH

where Z is saturated C_1–C_8-hydrocarbon radical, and

(II*b*) from 0.01 to 40 parts by weight of a transition metal composition, are brought into contact with one another to form a suspension (III), with the proviso that the weight ratio of inorganic oxidic substance (I) to transition metal composition (II*b*) is from 1:0.01 to 1:1.2, the suspension (III) is evaporated to dryness at below 200° C., and above the melting point of the alcohol (II*a*) used, a solid-phase intermediate (IV) being formed, and

(1.2) thereafter

(1.2.1) the solid-phase intermediate (IV) obtained from stage (1.1) and

(1.2.2) a solution, in an organic solvent, of an aluminum compound (V) of the formula

AlR_mX_{3-m}

where X is a radical OR, chlorine, bromine or hydrogen, R is a C_1–C_{18}-hydrocarbon radical, and m is a number from 1 to 3, are brought into contact with one another to form a suspension, with the proviso that the weight ratio of the solid-phase intermediate (IV) to the aluminum compound (V) is from 1:0.05 to 1:2, and the resulting suspended solid-phase product (VI) is the transition metal catalyst component (I), wherein the transition metal catalyst component (1) employed is a solid-phase product (VI) obtained using a transition metal composition (II*b*) comprising (II*b*1) 100 molar parts of a vanadium trihalide in which the halogen can be chlorine and/or bromine, and (II*b*2) from 5 to 400 molar parts of a zirconium tetrahalide in which the halogen can be chlorine and/or bromine with the further proviso that the metal compound components of solid phase product (VI) are derived solely from substance (I), compound (V) and the transition metal compounds in composition (II*b*).

4,525,551

HIGHLY ACTIVE AND EFFICIENT POLYOLEFIN CATALYST

Robert R. Schmidt, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 357,356, Mar. 12, 1982, abandoned. This application Dec. 2, 1983, Ser. No. 558,542

Int. Cl.³ C08F *4/64, 10/00*

U.S. Cl. 526—116 **24 Claims**

1. A process for polymerizing alpha-olefins containing 2 to 14 carbon atoms and mixtures of such alpha-olefins to prepare poly-alpha-olefins having a melt viscosity of from 10 to 2,500,000 cp at 150° C., said process comprising polymerizing such alpha-olefins at a temperature of about 125° C. to about 250° C. with a catalyst containing trialkyl aluminum and a complex of titanium chloride and vanadium halide, said complex being prepared by heating a mixture consisting of titanium tetrachloride and vanadium tetrahalide in a hydrocarbon medium at a temperature of at least 60° C. for at least 0.25 hour, the mol ratio of titanium to vanadium in said mixture being 1/3 to 60/1.

4,525,552

PROCESS FOR PRODUCING POLYOLEFINS

Nobuyuki Kuroda, Yokohama; Toru Nakamura, Kawasaki; Yutaka Shikatani, Yokohama; Kazuo Matsuura, Tokyo, and Mitsuji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 329,026, Dec. 9, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 577,327

Claims priority, application Japan, May 7, 1981, 56-68684

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—116 **11 Claims**

1. A process for the production of polyolefins which comprises homopolymerizing or copolymerizing α-olefins of 2 to 8 carbon atoms in the presence of a catalyst comprising a solid carrier carrying 1 to 10 percent by weight of a tetravalent titanium compound and/or a vanadium compound and an organometallic compound, the polymerization being effected at a temperature of 50° to 100° C. and at a pressure of 2 to 60 $kg./cm.^2$, said solid carrier resulting from the reaction of:

(a) a magnesium halide;

(b) a compound represented by the formula

$Al(OR)_nX_{3-n}$

where R is a hydrocarbon residual group having 1 to 24 carbon atoms, X is a halogen atom and n is $1 \leqq n \leqq 3$, and wherein the mol ratio of said magnesium halide (a) to said compound (b) in terms of Mg/Al is in the range of 1/0.05 to 1/0.5; and

(c) a compound represented by the formula

$Si(OR')_mX_{4-m}$

where R′ is a hydrocarbon residual group having 1 to 20 carbon atoms, X is a halogen atom and m is $1 \leqq m \leqq 4$, and wherein said compound (c) is used in an amount of 0.1 to 50 grams per 100 grams of said magnesium halide (a),

at least two components of said solid carrier selected from said magnesium halide (a), said compound (b) and said compound (c) being reacted in the presence of an inert solvent at a temperature of 20° to 400° C.

4,525,553

ACRYLIC POLYMERIZATION CATALYSTS CONTAINING FERRICENIUM SALTS

John M. Rooney, Naas, and Paul Conway, Cobh, both of Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Filed Feb. 21, 1984, Ser. No. 581,857

Int. Cl.³ C08F *4/82*

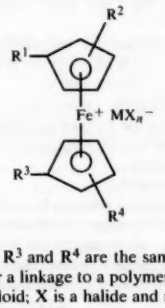
U.S. Cl. 526—120 **10 Claims**

1. A curable composition comprising

(a) an acrylic monomer;

(b) a peroxy initiator; and

(c) a ferricenium salt represented by the formula:



where R^1, R^2, R^3 and R^4 are the same or different H or alkyl groups or a linkage to a polymeric backbone, M is a metal or metalloid; X is a halide and n is an integer equal to 1+the valency of M.

4,525,554
PROCESS FOR POLYMERIZING OLEFIN

Toru Tanaka, Komae; Kazutoshi Iwatani, Hadano; Nobuo Enokido, Tokyo; Atsushi Murakami, Kawasaki, and Yukio Yamaguchi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,480
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—124 **12 Claims**

1. A process for polymerizing an olefin to obtain substantially narrow molecular weight distribution in the presence of a high yield catalyst system consisting essentially of the steps of combining an organo aluminum compound with a hydrocarbon insoluble solid catalytic component prepared by treating a hydrocarbon solution containing a magnesium compound and a titanium compound, with an aluminum halide having the formula

$$AlR^1_lX_{3-l},$$

wherein R^1 represents an alkyl, aryl or cycloalkyl group and X^1 represents a halogen atom, and l is $1 \leqq l \leqq 2$, the magnesium compound is a compound having the formula

$$Mg(OR^2)_mX_{2-m},$$

wherein R^2 represents an alkyl, aryl or cycloalkyl group; X^2 represents a halogen atom; and m is 1 or 2; the titanium compound is a compound having the formula

$$Ti(OR^3)_nX_{4-n},$$

wherein R^3 represents an alkyl, aryl or cycloalkyl group; X^3 represents a halogen atom; n is 1, 2 or 3; and the molar ratios of said magnesium compound, titanium compound and aluminum halide are in the ranges:

$$1 \leqq Mg/Ti \leqq 4$$

$$1 \leqq \frac{X^1 + X^2 + X^3}{OR^2 + OR^3} \leqq 4.$$

4,525,555
PROCESS FOR PREPARING POLYOLEFINS

Yoshio Tajima, Tokyo; Mituji Miyoshi, Fujisawa; Shoji Sugita, Kawasaki; Kiyoshi Kawabe, Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,936
Claims priority, application Japan, Jan. 14, 1983, 58-3558; Jan. 14, 1983, 58-3559; Jan. 14, 1983, 58-3560; Jan. 14, 1983, 58-3561
Int. Cl.³ C08F *4/44, 10/04*
U.S. Cl. 526—125 **5 Claims**

1. A process for preparing a polyolefin, characterized by polymerizing at least one α-olefin in the presence of a catalyst which consists of the combination of:

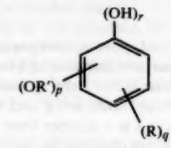
a solid catalyst component consisting of a solid substance obtained by reacting the following components (1) through (3) with one another and (4) a titanium compound supported on said solid substance:

(1) a magnesium halide,

(2) at least one member selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, vinyltriphenoxysilane, allyltrimethoxysilane, allyltriethoxysilane and allyltriphenoxysilane, and

(3) at least one compound selected from the group consisting of:

(a) compounds represented by the general formula



wherein R is hydrogen, a halogen atom, or a hydrocarbon radical having 1 to 24 carbon atoms, R′ is a hydrocarbon radical having 1 to 24 carbon atoms, and r, p and q are integers satisfying the following conditions: $1 \leqq r \leqq 3$, $0 \leqq p < 6$, $0 \leqq q < 6$, $1 \leqq r+p+q < 6$,

(b) compounds represented by the general formula $P(OR^5)_3$ wherein R^5s, which may be alike or different, are each a hydrocarbon radical having 1 to 24 carbon atoms,

(c) heterocyclic carboxylic acid esters containing oxygen as the hetero-atom;

(d) heterocyclic carboxylic acid esters containing nitrogen as the hetero-atom;

(e) heterocyclic carboxylic acid esters containing sulfur as the hetero-atom.

(f) compounds represented by the general formula $R^6_tSi(OH)_{4-t}$ wherein R^6 is a hydrocarbon radical having 1 to 24 carbon atoms and t is $1 \leqq t \leqq 3$,

(g) compounds represented by the general formula $B(OR^7)_uX_{3-u}$ wherein R^7 is a hydrocarbon radical having 1 to 24 carbon atoms, X is a halogen atom and u is $1 \leqq u \leqq 3$,

(h) compounds represented by the general formula $R^8_2SO_{w+1}$ wherein R^8s, which may be alike or different, are each a hydrocarbon radical having 1 to 24 carbon atoms or an alkoxy group and w is 0 or 1, and

(i) compounds represented by the general formula $R^9NHCOOR^9$ wherein R^9s, which may be alike or different, are each a hydrocarbon radical having 1 to 24 carbon atoms;

an organoaluminum compound; and

a compound selected from the group consisting of monophenyltrimethoxysilane and monophenyltriethoxysilane,

wherein said solid substance is obtained by a co-pulverization at a temperature of 0–200 degrees C. for a time of 0.5 to 30 hours of said components (1), (2) and (3), wherein the ratio of said component (1) to said component (2) is in the range of 1:0.001 to 1:10 in mole ratio, wherein the ratio of said component (1) to said component (3) is in the range of 1:0.001 to 1:10 in terms of mole ratio, and wherein the amount of said compound relative to the titanium compound in said catalyst compnent is in the range of 0.1:1 to 100:1 in terms of Si:Ti ratio.

4,525,556
POLYMERIZATION OF OLEFINS

William M. Coleman, III, Lake Jackson, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 407,856, Aug. 13, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 575,616
Int. Cl.³ C08F *4/64, 10/02*
U.S. Cl. 526—125 **30 Claims**

1. A process for polymerizing ethylene or a mixture of ethylene and at least one polymerizable ethylenically unsaturated monomer under suitable polymerization conditions in the presence of a supported catalyst composition resulting from reacting in an inert hydrocarbon medium

(A) at least one hydrocarbon soluble organomagnesium component represented by the formula $MgR''_{2.x}MR''_y$ wherein each R″ is independently a hydrocarbyl group having from 1 to 20 carbon atoms; M is a metal selected from Al, Zn, Si, Sn, B and P; y has a number corresponding to the valence of M and x has a value from about 0.001 to about 10;

(B) a sufficient quantity of at least one halide source so as to convert all of the organic groups attached to a magnesium

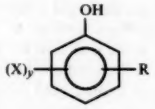
atom in component (A) to a halide group; said halide source being selected from

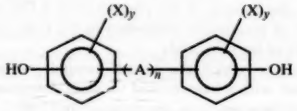
(1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms and such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen; or

(2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl group having from 1 to about 20 carbon atoms, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y;

(C) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20, carbon atoms; X is a halogen and x has a value from zero to 4; with

(D) at least one compound containing at least two aromatic hydroxyl groups represented by the formulas


I.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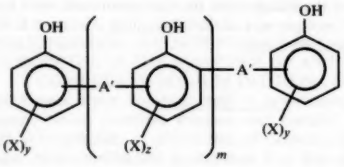
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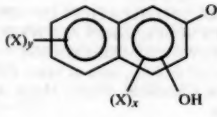
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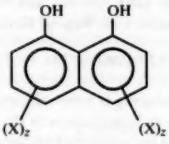
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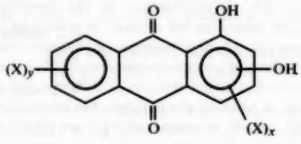
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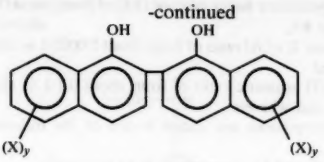
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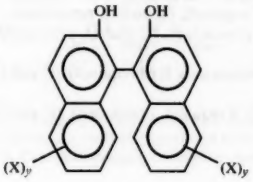
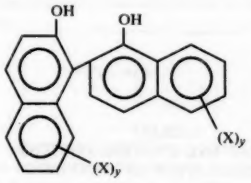
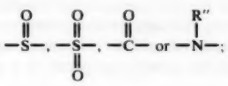

VIII.


IX.

wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbon atoms —O—, —S—, —S—S—,



each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R is independently —OH,

or a hydroxyl substituted hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms; each R' is independently hydrogen, hydroxyl or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; each R'' is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; each X is independently a hydroxyl group, a nitro group, a nitrile group, a hydrocarbyl group, a hydrocarbyloxy group, a hydroxyl substituted hydrocarbyl or a hydroxyl substituted hydrocarbyloxy group each such groups having from 1 to about 20 carbon atoms or a halogen; m has an average value of from about 0.01 to about 6; each n independently has a value of zero or 1; each x independently has a value of zero or 1; each y independently has a value of from zero to 4, and z has a value of from zero to 3; and when components (A) and/or (C) do not contain or contain an insufficient quantity of aluminum, then

(E) an aluminum compound represented by the formula $AlR_{y'}X_{y''}$ wherein R is a hydrocarbyl group having from 1 to about 10 carbon atoms; X is halogen and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three is employed;

and wherein the components are employed in quantities so as to provide the following ratios:

(1) a Mg:Ti atomic ratio of from about 1:1 to about 200:1;

(2) components (C) and (D) are employed in quantities

which provide a molar ratio of D:C of from about 0.1:1 to about 4:1;

(3) an excess X to Al ratio of from about 0.0005:1 to about 10:1; and

(4) an Al:Ti aromatic ratio of from about 0.1:1 to about 2000:1; and wherein

the catalyst components are added in one of the following orders:

(1) A, B, (C and D, prereacted), E (if required);

(2) A, B, E (if required), (C and D, prereacted);

(3) (A and B, prereacted), (C and D, prereacted), E, (if required);

(4) (A and B, prereacted), E (if required), (C and D, prereacted); and

(5) (A, B and E, if required, prereacted), (C and D, prereacted).

4,525,557

CATALYST AND PROCESS FOR THE POLYMERIZATION OF ETHYLENE

William J. Heilman, and Richard A. Kemp, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1984, Ser. No. 584,165

Int. Cl.[3] C08F *4/44, 110/02;* C01B *15/14*

U.S. Cl. 526—128 **10 Claims**

1. A process for the polymerization of ethylene which comprises polymerizing ethylene in the presence of a catalytic amount of an organo-aluminum compound and a catalytic amount of a catalytic complex prepared by a process which comprises:

(a) reacting a silanol having the formula:

where R, R′ and R″ can be the same or different and are selected from the group consisting of aliphatic hydrocarbons having from 2 to 12 carbon atoms or phenyl or substituted phenyl where such substituents have from one to three alkyl groups having from one to four carbon atoms and wherein R″ can additionally be selected from —OH with a magnesium dialkyl wherein each alkyl group can have from one to 12 carbon atoms to form a first reaction product;

(b) reacting said first reaction product with trichlorosilane to form a second reaction product; and

(c) reacting said second reaction product with a metal compound having the formula:

MeX_4

where Me can be titanium or vanadium and wherein X is chlorine, bromine, or $—OR_1$ where R_1 is a hydrocarbon radical having from 1 to 10 carbon atoms and wherein at least two of the X substituents are selected from chlorine and bromine to form the desired catalytic complex and wherein said catalytic complex the molar ratio of Me to Si is from about 0.33:1 to 11:1 and wherein the molar ratio of Me to Mg is from 0.33:1 to 11:1 and wherein the molar ratio of the organo-aluminum compound to said catalytic complex is from 1:1 to 1000:1.

4,525,558

CATALYTIC COMPONENT FOR POLYMERIZATION OF α-OLEFIN AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Masaru Takitani; Shizuo Tomiyasu, and Keikichi Baba, all of Shinnanyo, Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 386,585, Jun. 9, 1982, Pat. No. 4,439,539. This application Jan. 26, 1984, Ser. No. 573,995

Claims priority, application Japan, Jun. 11, 1981, 56-89859

Int. Cl.[3] C08F *4/44*

U.S. Cl. 526—142 **2 Claims**

1. A method for homo- or co-polymerization of an α-olefin wherein the polymerization is carried out in the presence of a catalytic composition comprising an α-olefin polymerizing catalytic component and an organo-aluminum compound, said catalytic component being prepared through sequential steps including:

(a) a step in which an organo-magnesium compound expressed by the generic formula of R′MgX′ (wherein R′ represents a hydrocarbon group having 1 to 20 carbon atoms and wherein X′ is either halogen atoms chosen out of chlorine, bromine and iodine or is R′ is reacted with carbon tetrahalide in the presence of an electron donor compound to obtain a solid-liquid product which is subjected to a solid-liquid separation process at a temperature between −50° C. and 100° C. to separate the solid from the solid-liquid separation product;

(b) a step in which the separated solid is heat treated with a carbon halide at a temperature between 40° and 80° C., the amount of the carbon halide is at least 0.1 mol per mol of magnesium contained in the solid product;

(c) a step in which the heat treated solid product of step (b) is treated with phenols at a temperature between 90° C. and 180° C., the amount of the phenols used is 0.01 to 10 mol per mol of magnesium contained in the heat treated solid product of step (b); and

(d) another step in which the phenol treated product is treated further with a halogenated titanium compound at a temperature between room temperature and 150° C., the amount of the halogenated titanium compound used is at least 0.01 mol per mol of the magnesium contained in the phenol treated product.

4,525,559

SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WHEREIN SUSPENSION AGENT IS ADDED AFTER THE MONOMER CHARGE

Gilbert Sielfeld, and Rudolf de Jong, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 409,795

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132890

Int. Cl.[3] C08F *2/20*

U.S. Cl. 526—200 **6 Claims**

1. In a process for producing a vinyl chloride polymer or copolymer by suspension polymerization in the presence of a suspension stabilizer, and a monomer-soluble catalyst, comprising carrying out the polymerization in the presence of 0.4–8.0% by weight, based on the amount of monomer, of an ethylene-vinyl actate copolymer having a vinyl acetate content of 42–48% by weight and a viscosity number of 95–210 ml/g, measured in toluene in a concentration of 0.005 g/cm^3 at 25° C.; the improvement wherein the catalyst, the ethylene-vinyl acetate copolymer, and the monomer charges are added to the polymerization charge before addition of the suspension agent.

4,525,560

SOLUTION POLYMERIZATION OF CONJUGATED DIENES

Richard L. Smith, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 152,066, May 20, 1980, abandoned, which is a continuation of Ser. No. 40,020, May 18, 1979, abandoned. This application Mar. 25, 1983, Ser. No. 478,750

Int. Cl.³ C08F *36/06*

U.S. Cl. 526—201 31 Claims

1. In the organolithium initiated solution polymerization of monomers comprising at least one polymerizable conjugated diene, and optionally at least one polymerizable monovinylarene hydrocarbon, the method of producing high levels of polymer solids without the requirement of cooling during polymerization comprising polymerizing the same said monomers in successive increments by contacting each incremental portion of said monomers with an organolithium initiator under solution polymerization conditions using hydrocarbon solvent, said hydrocarbon solvent consisting essentially of a hydrocarbon other than hexane if arenes are included in said monomers, until substantially all of the monomers in said portion have been polymerized, terminating the living polymer of each polymerization step with at least enough terminating agent to deactivate substantially all of the active polymer lithium, and employing at least a portion of the terminated polymer from the preceding polymerization step as at least a portion of the diluent for each succeeding polymerization step, wherein the amount of hydrocarbon solvent per quantity of monomer employed in each polymerization step is such that the weight percent polymer solids after that polymerization step is greater than the weight percent polymer solids produced in the preceding step and wherein the total amount of monomers and the reaction conditions are such that the weight percent polymer solids of conjugated diene polymer that is obtained is greater than the maximum weight percent solids of conjugated diene polymer having essentially the same physical properties that can be obtained by polymerizing all said monomers in one step without the use of cooling during polymerization.

4,525,561

POLYMERIZING PHENOTHIAZINE STABILIZER CHLOROPRENE IN THE PRESENCE OF AN INITIATOR COMPRISING SODIUM DITHIONATE

Rudolf Casper; Peter Wendling, both of Leverkusen; Wolfgang Konter, Neuss; Gottfried Pampus, and Gerhard Hohmann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 407,124, Aug. 11, 1982, abandoned, which is a division of Ser. No. 234,948, Feb. 17, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,418

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006802

Int. Cl.³ C08F *136/18*

U.S. Cl. 526—220 3 Claims

1. In the process of polymerizing an aqueous emulsion of chloroprene monomer stabilized with phenothiazine, the improvement wherein said polymerization is initiated in the presence of said stabilizer and molecular oxygen with a polymerization initiator comprising sodium dithionite.

4,525,562

THERMALLY STABLE DRILLING FLUID ADDITIVE

Arvind D. Patel, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

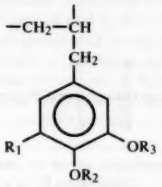
Filed Jun. 7, 1983, Ser. No. 501,900

Int. Cl.³ C08F *222/04;* C09K *7/00*

U.S. Cl. 526—271 9 Claims

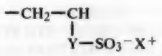
1. A water soluble polymer having thermal stability and exhibiting utility as an aqueous drilling fluid additive comprising:

(a) a major portion of a catechol based monomer having the formula:

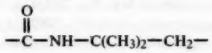


wherein R_1 is a hydrogen, hydroxyl or methoxy; wherein R_2 is a hydrogen, methyl or part of a methylene group and wherein R_3 is a hydrogen, methyl or part of a methylene group;

(b) a minor portion of an unsaturated sulfonic acid of the formula:



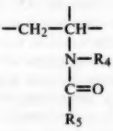
wherein Y represents a direct combination or a bridging element according to the formula:



and X^+ represents a cation;

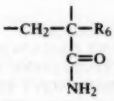
(c) a minor portion of a dicarboxylic acid monomer;

(d) an N-vinyl acylamine having the structure:



wherein R_4 is a hydrogen, a methyl or part of a cyclic trimethylene group and R_5 is a hydrogen, a methyl or part of a cyclic trimethylene group; and

(e) a substituted amide of the formula:



wherein R_6 is a hydrogen or a methyl group.

4,525,563

OXYGEN PERMEABLE SOFT CONTACT LENS COMPOSITION

Takanori Shibata; Toshiharu Yoshikawa, both of Nagoya; Kenichi Isobe, and Shoji Ichinohe, both of Annaka, all of Japan, assignors to Toyo Contact Lens Co., Nagoya and Shin-Etsu Chemical Co., Ltd., Tokyo, both of, Japan

Filed Mar. 13, 1984, Ser. No. 589,251

Claims priority, application Japan, Apr. 6, 1983, 58-60305

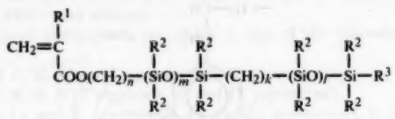
Int. Cl.³ C08F *30/08*

U.S. Cl. 526—279 2 Claims

1. A copolymer suitable for use in the production of an

oxygen permeable soft contact lens, comprising a copolymer of the following monomers:

(a) a hydrophilic siloxanylalkyl ester having the formula (I):



(I)

wherein R^1 is hydrogen atom or methyl group, R^2 is methyl group or $-OSi(CH_3)_3$, R^3 is a hydrophilic group selected from the group consisting of an oligo ether residue, a diol residue, an aminohydrin residue and an acid amido residue, n is an integer of 1 to 4, m and l are 0 or an integer of 1 to 2, and k is an integer of 2 to 4, or an admixture thereof,

(b) a hydrophilic monomer other than said monomer (a), and

(c) a hydrophobic monomer.

4,525,564

HIGH MODULUS, LOW CREEP STRAIN POLYALKENE POLYMER MATERIALS

Giancarlo Capaccio, Leeds, and Ian M. Ward, Bramhope near Leeds, both of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 943,856, Sep. 19, 1978, Pat. No. 4,268,470, which is a continuation of Ser. No. 739,074, Nov. 5, 1976, abandoned. This application Dec. 17, 1980, Ser. No. 217,511

Claims priority, application United Kingdom, Nov. 5, 1975, 45920/75

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ C08F *10/02*

U.S. Cl. 526—348.1 **6 Claims**

1. An oriented polymer material having a weight average molecular weight greater than 300,000; a ratio of weight average molecular weight to number average molecular weight greater than 5; and a creep strain at room temperature of less than 3% after 15 hours under a stress which produces an initial strain of 1% after 10 seconds, said polymer material being selected from the group consisting of ethylene/propylene block copolymers, ethylene/hexene-1-copolymers, polypropylene or a substantially linear polymer of ethylene containing at least 95% by weight of ethylene and having a density from 0.91 to 1.0 gm/cm^3 as measured by the method of British Standard Specification No. 2782 (1970) method 590B on a sample prepared according to British Standard Specification No. 3412 (1966) Appendix A and annealed according to British Standard Specification No. 3412 (1966) Appendix B(1).

4,525,565

SINGLE COMPONENT ORGANOPOLYSILOXANE COMPOSITIONS CONTAINING SILANES WITH ACYLOXY OR KETONIMINOXY GROUPS AS CROSS LINKING AGENTS AND ORGANIC DERIVATIVES OF TITANIUM OR ZIRCONIUM AS CATALYSTS

Bernard Laisney; Michel Letoffe, both of Sainte-Foy-les-Lyon; Patrice Perrin, Lyons, and Jean Ulrich, Saint-Syphorien d'Ozon, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 29, 1983, Ser. No. 518,488

Claims priority, application France, Jul. 30, 1982, 82 13505

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—17 **9 Claims**

1. A single component organopolysiloxane composition which is stable in storage in the absence of water and which comprises a mixture of the following:

(A) 100 parts of a polysiloxane consisting essentially of a α,ω-dihydroxydiorganopolysiloxane having a viscosity of from 700 to 1,000,000 mPa.s at 25° C., comprising a succession of diorganosiloxy units of the formula R_2SiO in which the symbols R, which can be identical or different, represent hydrocarbon radicals having from 1 to 8 carbon atoms and which are optionally substituted with halogen atoms or cyano groups,

(B) 2 to 25 parts of a cross-linking agent of the formula $R_aSi(OCOR^1)_{4-a}$ and/or the formula $R_{a'}Si(ON{=}CR^2_2)_{4-a'}$ wherein the symbols R have the significance given in (A), the symbol R^1 represents a hydrocarbon radical free of aliphatic unsaturation and having from 1 to 15 carbon atoms, the symbols R^2, which can be identical or different, represent alkyl radicals having from 1 to 8 carbon atoms, and the symbols a and a' represent zero or one,

(C) 0.0004 to 0.095 parts of a hardening catalyst, and

(D) 5 to 150 parts of mineral fillers, wherein the composition is further characterized in that the hardening catalyst (C) comprises either an organic derivative of titanium or an organic derivative of zirconium selected from:

(i)(a) organic titanium derivatives which comprise for each titanium atom at least one organosilicon radical bound to said titanium atom by a Ti—O—Si bond, with the other valences being satisfied by radicals from the group comprising Ti—O—C bonds, hydroxyl radicals, oxygen atoms of Ti—O—Ti bonds or chelation bonds, or,

(i)(b) organic titanium derivatives which comprise for each titanium atom at least one organic radical bound to said atom by a Ti—O—C bond, with the remaining valances of the titanium atom being satisfied by radicals of the group comprising hydroxyl radicals, oxygen atoms of Ti—O—Ti bonds or chelation bonds, or,

(ii) organic zirconium derivatives which comprise for each atom of zirconium at least one organic radical bound to said zirconium atom by a Zr—O—C bond, but with the proviso that there are no Zr—OCO-bonds originating from a carboxylic acid residue, with the remaining valences of the zirconium atom being satisfied by radicals of the groups comprising hydroxyl radicals, oxygen atoms of Zr—O—Zr bonds or chelation bonds.

4,525,566

COATING METHOD AND SILICONE COMPOSITION FOR PSA RELEASE COATING

Gary R. Homan, and David L. Stickles, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 2, 1984, Ser. No. 585,748

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—17 **6 Claims**

1. A liquid composition which cures when applied to a substrate and exposed to moisture, said liquid composition being prepared by mixing, under substantially anhydrous conditions, components comprising

(A) 100 parts by weight of an organopolysiloxane fluid bearing an average of at least two silicon-bonded, alkoxysilylorganic radicals per molecule, said radicals having the formula $-QSiR_a^1(OR^2)_{3-a}$ and said organopolysiloxane fluid having the formula $ZR_2^1SiO(Me_2SiO)_x(MeRSiO)_ySiR_2^1Z$,

(B) a titanium ester, or a partial hydrolyzate or partial alcoholate thereof, soluble in said liquid composition, in sufficient amount to provide from 0.5 to 4.0 parts by weight of titanium, and

(C) from 0.5 to 50 parts by weight of an aminoorganosiloxane bearing an average of at least 1 silicon-bonded aminoorgano radical per molecule, said aminoorgano radical having the formula $-Q(NR^3CH_2CH_2)_mNHR^3$, all other silicon-bonded radicals of the aminoorganosiloxane being selected from the group consisting of siloxane oxygen atoms, R^1 radicals and OR^2 radicals; wherein, independently at each occurrence in the components,

R denotes the $-QSiR_a^1(OR^2)_{3-a}$ radical;

R^1 denotes a monovalent hydrocarbon radical having from 1 to 6, inclusive, carbon atoms;

R^2 denotes a methyl, ethyl, propyl or methoxyethyl radical;
R^3 denotes a H atom or an R^1 radical;
Q denotes an alkylene radical;
Z denotes an R radical or an R^1 radical;
Me denotes a methyl radical;
a has a value of 0 or 1;
x has an average value of from about 50 to 500;
y has an average value of from 0 to (x+y)/4; and
m has a value of from 0 to about 3.

4,525,567

IONICALLY CROSS-LINKED SILOXANE POLYMERS

John R. Campbell, Clifton Park, and Robert E. Williams, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,165
The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—27 **3 Claims**

1. Zwitterionic siloxane polymers having at least 0.5 percent tertiary silicon atoms chemically combined in accordance with the formula

$$R^x—Si—(\theta)_3$$

wherein R^x is a zwitterion having a chemically combined unit selected from the group of formulas consisting of:

$$—R'—\overset{+}{N}H_2—R—SO_3^- \text{ and } —R'—NH_2\overset{+}{}—R—COO^-$$

wherein R is a divalent hydrocarbon radical of from 2 to 20 carbon atoms, R′ is a divalent radical of from 1 to 20 carbon atoms and θ are siloxane polymer segments having repeating units of a formula selected from the group consisting of

$$—(R_2'SiO)_m— \text{ and } —(R''SiO_{3/2})_m—$$

wherein R″ is a monovalent radical selected from the group consisting of hydrogen, alkyl radicals of from 1 to 10 carbon atoms and aryl radicals of from 1 to 20 carbon atoms and m is an integer of from 1 to about 2000.

4,525,568

STORAGE STABLE, ONE-PACKAGE HEAT CURABLE POLYURETHANE ADHESIVE COMPOSITIONS

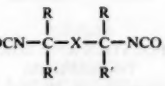
Eugene Y. C. Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1984, Ser. No. 586,885
Int. Cl.³ C08G *18/72*
U.S. Cl. 528—60 **12 Claims**

1. A storage stable, one package heat curable polyurethane adhesive composition, said composition comprising:

(a) a mixture of or a prepolymer adduct of:

(i) a poly aliphatic isocyanate compound of the formula:



wherein R and R′ are each, independently, selected from hydrogen, alkyl or substituted alkyl and X is a bridging means selected from aliphatic, cycloaliphatic, or aromatic groups, or a prepolymer adduct of said isocyanate compound possessing poly aliphatic isocyanate functionality; and

(ii) a monomeric or polymeric compound containing a plurality of hydroxyl groups; wherein component (ii) is added in an amount so as to provide less than a stoichiometrically equivalent amount of hydroxyl groups to said aliphatic isocyanate groups present in (a), in admixture with

(b) an amount of a curing agent comprising a monomeric or polymeric compound containing at least three hydroxyl groups, at least one of said hydroxyl groups being a secondary hydroxyl group, said curing agent being present in an amount sufficient to provide an approximately stoichiometrically equivalent amount of hydroxyl groups to said excess of aliphatic isocyanate groups in (a); and

(c) optionally, an effective amount of an inert filler.

4,525,569

THERMOSETTING COATING COMPOSITION

Panagiotis I. Kordomenos, Mt. Clemens, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1983, Ser. No. 565,321
Int. Cl.³ C08G *59/16*
U.S. Cl. 528—73 **24 Claims**

1. An organic solvent based thermosetting composition comprising:

(A) crosslinkable hydroxy functional epoxy ester resin having a number average molecular weight (Mn) between about 1,000 and about 5,000, said resin comprising the reaction product of diepoxide chain extended with dicarboxylic acid and chain terminated with acid component comprising hydroxy functional acid; and

(B) polyfunctional, hydroxy-reactive crosslinking agent selected from aminoplast crosslinking agent, blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups blocked by reaction with an active hydrogen bearing blocking agent, and a compatible mixture of any of them, said crosslinking agent being included in an amount such that at the cure temperature of the composition said cross-linking agent will provide between about 0.5 and about 1.6 hydroxy reactive groups per hydroxy group contributed by said epoxy ester resin.

4,525,570

HEAT-SETTING MIXTURES WHICH HAVE A LONG SHELF LIFE AND COMPRISE A POLYISOCYANATE AND COMPOUNDS WHICH ARE REACTIVE TOWARD ISOCYANATE GROUPS, AND THEIR PREPARATION

Rainer Blum, Ludwigshafen; Herbert Spoor, Limburgerhof; Rolf Osterloh, Gruenstadt; Gerhard Mosler, and Bernhard Rubbert, both of Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,002
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228723
Int. Cl.³ C08G *18/72, 18/48, 18/62*
U.S. Cl. 528—75 **6 Claims**

1. A heat-setting mixture which has a long shelf life at room temperature, can be used as a coating composition, an adhesive or a sealant material or as an undersealant for motor vehicles, and comprises a polyisocyanate and one or more compounds which are reactive toward isocyanate groups and may or may not contain additives, such as protective colloids, solvents, plasticizers, pigments, fillers, dyes or other assistants conventionally used in surface coating technology, wherein the polyisocyanate, in the form of discrete particles having a diameter of from 0.1 to 150 μm, is dispersed in a saturated or unsaturated amino-, hydrazide-, mercaptan- and/or carboxyl-containing polymer, polycondensate or polyadduct which has a functionality of more than 1 and may or may not contain the stated additives and not more than 95% of which may be replaced by polyols, and the polyisocyanate particles are deactivated at their surface, with the proviso that from 0.01 to 20 equivalent percent of the total amount of isocyanate groups present is deactivated.

4,525,571
EPOXY RESIN/CYCLOALIPHATIC AMINE CURING AGENT MIXTURES

Christian Burba, Ascheberg-Herbern, and Herbert Franz, Hamm, both of Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,044

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324873

Int. Cl.³ C08G *59/50*

U.S. Cl. 528—111 **6 Claims**

1. A method for making a curable synthetic resin composition suitable for the production of surface coatings, which method comprises reacting

(1) a solid or liquid polyglycidyl ether having an epoxy value from 0.1 to 0.6 with

(2) a polyamine which is the reaction product of epichlorohydrin and a cycloaliphatic diprimary diamine and which has an average of more than two reactive amino hydrogen atoms per molecule,

said polyglycidyl ether and polyamine being reacted in a molar ratio between 1:>1 and 1:2.

4,525,572
HEAT-CURABLE MIXTURES, STABLE ON STORAGE, BASED ON POLYIMIDES AND CONTAINING POLYMERIZATION CATALYSTS

Hermann Dietheim, Aesch, and Sheik A. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 449,023, Dec. 13, 1982, Pat. No. 4,463,147. This application Apr. 16, 1984, Ser. No. 600,867

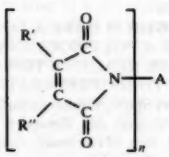
Claims priority, application Switzerland, Dec. 23, 1981, 8253-81

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—170 **10 Claims**

1. A heat-curable mixture, stable on storage and based on a polyimide and a polymerization catalyst, which comprises

(a) a polymaleimide of the formula I

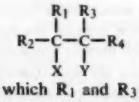


(I)

in which R′ and R″ are a hydrogen atom or a linear or branched alkyl group having 1 to 4 C atoms and A is a divalent, trivalent or tetravalent aliphatic radical having 2 to 30 C atoms, a cycloaliphatic radical, an aromatic radical, a heterocyclic radical or an araliphatic radical and n is 2, 3 or 4, or, when n is 2, A is also a direct bond,

(b) a compound having at least two functional groups of the same or different type and having no olefinic double bond in the molecule, which compound undergoes an addition or polymerization reaction with the maleic double bond, or a still fusible prepolymer of such a component with (a), and

(c) in an amount of 0.1 to 10% by weight, based on the sum of the amounts of (a), (b) and (c), of a polymerization catalyst of the formula II



(II)

in which R_1 and R_3 are each an aromatic radical, R_2 is a hydrogen atom or an aliphatic or aromatic radical, R_4 is an aliphatic or aromatic radical and X and Y, independently of one another, are each a free or masked hydroxyl group or a halogen atom.

4,525,573
THERMOSET POLYMERS AND PREPOLYMERS OBTAINED BY POLYCONDENSATION OF ALKYL PYRIDINE WITH HYDROXYL AROMATIC MONOALDEHYDES

Marcel Ropars, Rocquen Court, and Bertrand Bloch, Paris, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris and Office National d'Etudes et de Recherches Aerospatiales, Bagneux, both of, France

Filed Aug. 24, 1984, Ser. No. 644,195

Claims priority, application France, Sep. 13, 1983, 83 14546

Int. Cl.³ C08G *12/08*

U.S. Cl. 528—232 **18 Claims**

1. Thermoset prepolymers wherein they consist, at least in part, of the polycondensation reaction products of one or more pyridine derivatives containing at least two activated methyl groups in the 2, 4, 6-positions with one or more aromatic monoaldehydes containing at least one hydroxyl group.

4,525,574
POLYESTERS POLYOLS PREPARED FROM GLUTARIC ACID, SUCCINIC ACID AND ADIPIC ACID, AND POLYURETHANES PREPARED THEREFROM

George N. Altounian, Cap Rouge, Canada, assignor to Centre de Recherche Industrielle de Quebec, Pointe-Claire, Canada

Filed Jul. 26, 1983, Ser. No. 517,397

Claims priority, application Canada, Feb. 11, 1983, 427364

Int. Cl.³ C08G *63/22*

U.S. Cl. 528—283 **1 Claim**

1. Process for preparing polyols which comprises

(a) introducing in a reactor a mixture of acids comprising about 50 to 70% by weight of glutaric acid, about 15 to 30% by weight of succinic acid and about 10 to 20% by weight of adipic acid, or esters or anhydrides thereof, with at least one polyhydroxy alcohol selected from the group consisting of secondary alcohols, tertiary alcohols, and highly cluttered alcohols, with a catalyst selected from the group consisting of stannous chloride, stannic chloride and alkyl-tin compounds;

(b) flushing the reaction mixture with an inert gas;

(c) heating the reaction mixture while stirring at a temperature not exceeding about 225° C.;

(d) removing 90 to 95% of the water or methanol formed during step (c);

(e) introducing into the reactor at least one primary alcohol which is not cluttered;

(f) heating to about 225° C. and removing by distillation the maximum of water or methanol;

(g) ending the reaction by placing the reactor under vacuum in order to remove all traces of water or methanol in the reaction mixture and continuing this operation until the polyol obtained has an acid value lower than 3, a hydroxyl functionality at least equal to 2.0 and a hydroxyl number lower than 600.

4,525,575
POLYESTER POLYOLS AND MIXTURES MADE THEREFROM

Robert P. Yeater, Moundsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 5, 1983, Ser. No. 520,665

Int. Cl.³ C08G *63/66*

U.S. Cl. 528—301 **4 Claims**

1. A polyester polyol having an hydroxyl number of from about 25 to about 130 and an acid number of 2 or less, produced by reacting

(a) from about 40 to about 60 parts by weight of adipic acid,

(b) from about 1 to about 20 parts by weight of ethylene glycol,

(c) from about 1 to about 30 parts by weight of 1,4-butanediol, and

(d) from about 5 to 50 parts by weight of a polyoxyethylene glycol having a molecular weight of from 106 to 680,

the total parts of (a), (b), (c) and (d) being 100.

4,525,576
PROCESS FOR PRODUCING SEQUENTIAL POLYAMINO ACID RESIN

Ikuo Hayashi, Koriyama; Tadao Itikawa, Fukushima; Keizo Ogihara, Sukagawa, and Kiyoshi Shimizu, Koriyama, all of Japan, assignors to Nitto Boseki Co. Ltd., Fukushima, Japan

Filed Oct. 15, 1984, Ser. No. 660,946

Claims priority, application Japan, Oct. 17, 1983, 58-193945

Int. Cl.³ C08G *69/08, 73/10, 69/10*

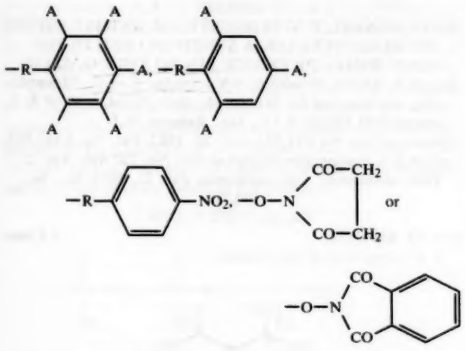
U.S. Cl. 528—313 **8 Claims**

1. A process for producing a sequential polyamino acid resin having a high molecular weight and special amino acid sequence as repeating unit in the resin, which comprises

conducting a polycondensation reaction of a dipeptide active ester acid salt represented by the formula:

$$H—X_1—X_2—Y.Z \quad (I)$$

wherein X_1 and X_2 are independently L-, D- or DL-α-amino acid residues protected or non-protected at a side chain in the formula: $H—X_1—OH$ or $H—X_2—OH$ in which H is a hydrogen atom in an amino group and may be replaced by a protective group for an amino acid, and OH is the hydroxyl moiety in a carboxyl group; H is a hydrogen atom in an amino group; Y is a functional group represented by the formula:



in which A is a chlorine or bromine atom, and R is a sulfur or oxygen atom; and Z is HBr, HCl, HF, CF_3COOH or p-toluenesulfonic acid, in an aprotic polar solvent in the presence of a tertiary amine and phosphorus pentoxide.

4,525,577
POLYMERS OF 3,3-DISUBSTITUTED-FURANDIONE COMPOUNDS

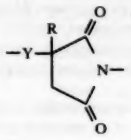
Edmund P. Woo, and Michael J. Mullins, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 214,611, Dec. 9, 1980, abandoned. This application Apr. 17, 1984, Ser. No. 601,147

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—327 **4 Claims**

1. A poly(imide)-containing polymer consisting essentially of recurring units of the formula



wherein:

Y is a divalent hydrocarbon group or a divalent hydrocarbon group containing oxygen, sulfur, nitrogen, silicon, phosphorus, or halogen atoms; and

R is phenyl or C_{1-10} alkyl.

4,525,578
PROCESS FOR THE PREPARATION OF POLYESTERAMIDE FROM CYCLIC LACTONE

Mu-Yen M. Wu, and Lawrence E. Ball, both of Cuyahoga Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 336,543, Jan. 4, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,616

Int. Cl.³ C08G *69/44*

U.S. Cl. 528—354 **13 Claims**

1. A process for preparing a solid moldable polyesteramide comprising polymerizing a cyclic lactone containing at least three carbon atoms with an ammonium salt of an alpha, beta-unsaturated monocarboxylic acid, wherein the molar ratio of the ammonium salt to the cyclic lactone is greater than 1.

4,525,579
PROCESS FOR THE PRODUCTION OF OPTIONALLY BRANCHED POLYARYLENE SULPHIDES WITH POLYHALOGENATED POLYAROMATIC COMPOUND

Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf; Wolfgang Koch, Bischoffen, and Walter Heitz, Kirchhain, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,420

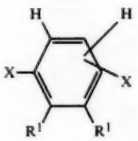
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312254

Int. Cl.³ C08G *75/16*

U.S. Cl. 528—388 **9 Claims**

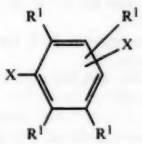
1. A process for the production of high molecular weight polyarylene sulphides having a high melt viscosity wherein:

(a) at least one dihalogen benzene, of which from 0 to 100 mol-% correspond to formula (I):



(I)

and from 100 to 0 mol-% correspond to formula (II):



(II)

X represents chlorine or bromine in the meta- or para-position to each other; and

R^1 which is the same or different, represents hydrogen,

C_1–C_{20} alkyl, C_5–C_{20} cycloalkyl, C_6–C_{24} aryl, C_7–C_{24} alkaryl or C_7–C_{24} aralkyl; and two groups R^1 in the ortho-position to each other when joined together form an aromatic or heterocyclic 6-membered ring having up to three O, N or S, hetero atoms, and one group R^1 is other than hydrogen; and

(b) from 0 to 3.0 mol-%, based on the sum of the aromatic dihalogen compounds (I) and (II), of an aromatic trihalogen or tetrahalogen compound corresponding to formula (III):

$$ArX_n \quad (III)$$

wherein

Ar represents an aromatic or heterocyclic group having from 6 to 24 carbon atoms and in which up to three ring carbon atoms are replaced by N, O or S hetero atoms;

X represents chlorine or bromine; and

n represents 3 or 4;

(c) at least one alkali metal sulphide with the molecular ratio of (a+b):c being from 0.85:1 to 1.15:1;

(d) in a polar solvent with the molar ratio of (c) and (d) being from 1:2 to 1:15, are reacted together with

(e) from 1 to 50 mol-%, based on the molar quantity of alkali metal sulphide, of a reducing agent and

(f) from 1 to 50 mol-% of a compound corresponding to formula (IV):

$$X_mAr-Y-ArX_m \quad (IV)$$

Ar and X are as defined above in formula (III); and

Y represents a single bond or Y represents oxygen, sulphur,

$$-SO_2-,\ -\overset{\overset{O}{\|}}{C}-\ \text{or}\ -CR^3R^4-,$$

wherein R^3 and R^4 represent hydrogen or an alkyl group having from 1 to 6 carbon atoms; and

m represents an integer of from 1 to 4;

the sum of (I), (II) and (IV) amounting to 100 mol-%, based on the mols of alkali metal sulphide.

4,525,580

METHOD FOR REDUCING COLOR OF POLY(TETRAMETHYLENE ETHER) GLYCOL WITH HYPOCHLORITE

Melvin C. Baker, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1984, Ser. No. 634,781

Int. Cl.³ C08J *3/00*

U.S. Cl. 528—490 **4 Claims**

1. A method for reducing the color level of a poly(tetramethylene ether)glycol the process comprising bringing the poly(tetramethylene ether)glycol into contact with hypochlorite ions for a time sufficient to bring the poly(tetramethylene ether)glycol to the desired shade.

4,525,581

INCREASING THE EFFICIENCY OF HIGH MOLECULAR WEIGHT CROSSLINKED POLYCARBOXYLIC ACIDS

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Gerhard Faulhaber, Bad Durkheim, and Hans-Jürgen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,244

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302496

Int. Cl.³ C08F *6/24*

U.S. Cl. 528—503 **7 Claims**

1. A process for increasing the efficiency of a high molecular weight cross-linked polycarboxylic acid copolymer which is used as a thickener for neutral and alkaline aqueous systems and is obtained by precipitation polymerization or suspension polymerization of the monomeric components of a mixture of (a) from 70 to 99.9% by weight of monoethylenically unsaturated carboxylic acids (b) from 0.1 to 10% by weight of ethylenically diunsaturated or polyunsaturated monomers as crosslinking agents and (c) from 0 to 20% by weight of other monoethylenically unsaturated monomers in an organic solvent in which the monomers are soluble and the copolymer is insoluble at a temperature no higher than 75° C., wherein the copolymer is heated in solid finely divided condition for from 2 minutes to 5 hours at from 80° to 130° C. but below the glass transition temperature of the copolymer, the time and temperature within such heating ranges being so selected as to obtain a copolymer whose gel when neutralized in electrolyte containing water is of higher viscosity than the unheated copolymer.

4,525,582

SILYL, BENZYL, P-NITROBENYL, OR METHYL ESTERS OF DIAZOACETATE, A SYNTHON USED IN THE CONVERSION OF PENICILLIN TO THIENAMYCIN

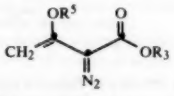
Joseph S. Amato, Brooklyn, N.Y.; Sandor Karady, Mountainside, and Leonard M. Weinstock, Belle Mead, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 391,032, Jun. 22, 1982, Pat. No. 4,444,685, which is a continuation-in-part of Ser. No. 257,695, Apr. 27, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,794

Int. Cl.³ C07C *113/00*

U.S. Cl. 534—558 **1 Claim**

1. A compound of the formula:



wherein R_3 is a member selected from the group consisting of trimethylsilyl, t-butyldimethylsilyl, triethylsilyl, methyl, benzyl, and p-nitrobenzyl; and R_5 is the same or different member of the group R_3 as defined above.

4,525,583

QUATERNARY AMMONIUM SUBSTITUTED BENZOTHIAZOLYLPHENYL AZO PYRIMIDINE DYES

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

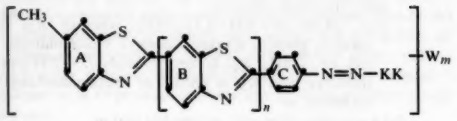
Filed Jan. 13, 1983, Ser. No. 457,822

Claims priority, application Switzerland, Jan. 19, 1982, 310/82

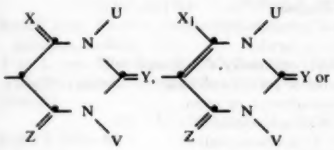
Int. Cl.³ C09B *29/036, 29/36, 44/08*; D06P *1/41*

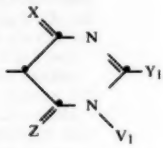
U.S. Cl. 534—606 **9 Claims**

1. A benzthiazole compound of the formula

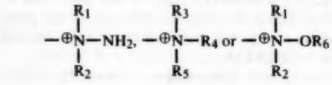


in which KK is the radical of a pyrimidine coupling component of the formula

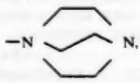




in which X and Z independently of one another are O or NH, Y is the group O, NH, S or N—CN, U and V independently of one another are hydrogen, C_1–C_4-alkyl which is unsubstituted or substituted by hydroxy or phenyl which is unsubstituted or substituted by C_1–C_4 alkyl, halogen or C_1–C_4 alkoxy, or one of the radicals U or V is CN and the other is hydrogen, X_1 is C_1–C_4-alkyl, Y_1 is hydrogen, NH—C_1–C_4-alkyl, NH-phenyl, N—(C_1–C_4-alkyl)$_2$, phenyl or C_1–C_4-alkyl and V_1 is hydrogen, C_1–C_4-alkyl which is unsubstituted or substituted by hydroxy or phenyl which is unsubstituted or substituted by C_1–C_4 alkyl, halogen or C_1–C_4alkoxy, W is a radical of the formula —CH$_2$—NH—CO—C_1–C_4-alkyl-Q$^{\oplus}$An$^{\ominus}$ in which An is an anion and Q is a quaternary radial of the formula



in which R_1 to R_6 independently of one another are C_1–C_4-alkyl which is unsubstituted or substituted by hydroxy, or the radicals R_1 and R_2, or R_3 and R_4 together with the N atom to which they are attached form a heterocyclic ring selected from morpholine, pyrrolidine, piperidine or piperazine, or R_3 and R_4 and R_5, together with the N atom to which they are attached, form a heterocyclic ring selected from pyridinium which is unsubstituted or substituted by C_1–C_4 alkyl or



m is the number 1, 2 or 3 and n is the number 0 or 1, and in which the benzene radicals A, B and C independently are unsubstituted or are substituted by C_1–C_4 alkyl.

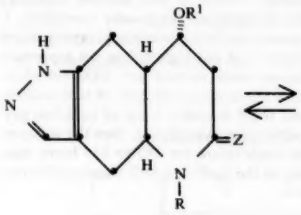
4,525,584

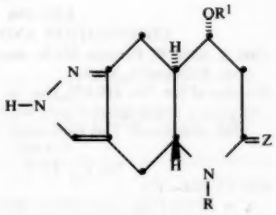
4AR,8AS,9R-5,6-PERMISSIBLY SUBSTITUTED-9-HYDROXY-OCTAHYDRO-1H(AND 2H) PYRAZOLO[3,4-8]QUINOLINE

Nancy G. Gallick-Whitaker, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1984, Ser. No. 637,355
Int. Cl.[3] **C07D** *471/00;* **C07H** *17/00;* **A01N** *43/42;* **A61K** *31/47*
U.S. Cl. 536—24 **4 Claims**

1. Tautomeric pairs of the formulas





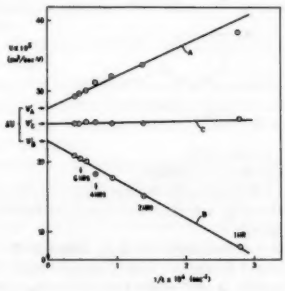
wherein R is methyl, ethyl, allyl, or n-propyl, R^1 is H or D-glucuronyl, and Z is O or H_2.

4,525,585

SODIUM CARBOXYMETHYLCELLULOSE

Atsushi Taguchi, and Takeo Ohmiya, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 30, 1983, Ser. No. 537,903
Claims priority, application Japan, Oct. 4, 1982, 57-174225
Int. Cl.[3] **C08B** *11/00*
U.S. Cl. 536—98 **5 Claims**



1. A composition consisting essentially of sodium carboxymethylcellulose having (1) an average degree of carboxymethyl substitution ($\overline{DS}$), per anhydroglucose unit, in the range of from 0.4 to 1.08, (2) a number-average degree of polymerization in the range of from 100 to 1500, and (3) a mobility distribution ΔU, as measured by electrophoresis in the range of from

$$\Delta U \times 10^5 < (-3.0 \log \overline{DS} + 3.20) \times 10^5 \text{ cm}^2/\text{sec}\cdot\text{V}$$

to

$$\Delta U \times 10^5 > (-2.0 \log \overline{DS} + 2.0) \times 10^5 \text{ cm}^2/\text{sec} \cdot V,$$

said composition having been prepared by the process comprising the steps of forming an alkali cellulose solution, reacting said alkali cellulose with an etherifying agent consisting essentially of an esterification product of monochloroacetic acid with isopropyl alcohol, and then recovering said composition, said composition having a salinity resistance viscosity ratio of at least 1.02, said salinity resistance viscosity ratio being determined by dividing the viscosity of a 4% aqueous NaCl solution containing 1 wt.% of said sodium carboxymethylcellulose by the viscosity of pure water containing 1 wt.% of said sodium carboxymethylcellulose, said composition having an enzyme resistance of not higher than 9.4 expressed as the number of glucose units formed per 1000 anhydroglucose units when, to a 1% aqueous solution of said sodium carboxymethylcellulose, there is added 5 mg of cellulase per gram of said sodium carboxymethylcellulose, then the solution is hydrolyzed at room temperature for 140 to 145 hours and then the glucose formed as the hydrolyzate is measured by the glucose oxidase method.

4,525,586

COMPOSITION AND PROCESS

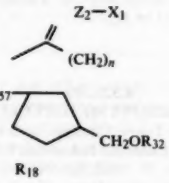
Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 219,175, Dec. 22, 1980, Pat. No. 4,420,632, which is a continuation-in-part of Ser. No. 140,547, Apr. 15, 1980, abandoned. This application Sep. 19, 1983, Ser. No. 533,489

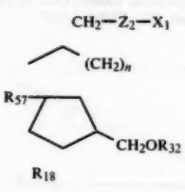
Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 544—174 **3 Claims**

1. A carbacyclin intermediate of formula VI or VII:



VI



VII

wherein n is one or 2;

wherein R_{57} is $(C_1$–$C_4)$alkyl;

wherein R_{18} is hydrogen, hydroxy, hydroxymethyl, $—OR_{10}$ or $—CH_2OR_{10}$, wherein R_{10} is an acid-hydrolyzable protective group;

wherein R_{32} is hydrogen or R_{31}, wherein R_{31} is selected from an acyl protective group, an acid hydrolyzable protective group, a silyl protective group and an arylmethyl hydroxy hydrogen replacing group;

wherein X_1 is

(1) $—COOR_1$, wherein R_1 is

(a) hydrogen,

(b) $(C_1$–$C_{12})$alkyl,

(c) $(C_3$–$C_{10})$cycloalkyl,

(d) $(C_7$–$C_{12})$aralkyl,

(e) phenyl, optionally substituted with one, 2 or 3 chloro or $(C_1$–$C_3)$alkyl,

(f) phenyl substituted in the para position by

(i) $—NH—CO—R_{25}$,

(ii) $—CO—R_{26}$,

(iii) $—O—CO—R_{24}$, or

(iv) $—CH=N—NH—CO—NH_2$ wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{24} is phenyl or acetamidophenyl; inclusive, or

(g) a pharmacologically acceptable cation;

(2) $—CH_2OH$,

(3) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are

(i) hydrogen,

(ii) $(C_1$–$C_{12})$alkyl,

(iii) $(C_3$–$C_{10})$cycloalkyl,

(iv) $(C_7$–$C_{12})$aralkyl,

(v) phenyl, optionally substituted with one, 2 or 3 chloro or $(C_1$–$C_3)$alkyl, hydroxy, carboxy, $(C_2$–C_5-)alkoxycarbonyl, or nitro,

(vi) $(C_2$–$C_5)$carboxyalkyl,

(vii) $(C_2$–$C_5)$carbamoylalkyl,

(viii) $(C_2$–$C_5)$cyanoalkyl,

(ix) $(C_3$–$C_6)$acetylalkyl,

(x) $(C_7$–$C_{11})$benzoalkyl, optionally substituted by one, 2 or 3 chloro, $(C_1$–$C_3)$alkyl, hydroxy, $(C_1$–C_3-)alkoxy, carboxy, $(C_2$–$C_5)$alkoxycarbonyl, or nitro,

(xi) pyridyl, optionally substituted by one, 2 or 3 chloro, $(C_1$–$C_3)$alkyl, or $(C_1$–$C_3)$alkoxy,

(xii) $(C_6$–$C_9)$pyridylalkyl optionally substituted by one, 2 or 3 chloro, $(C_1$–$C_3)$alkyl, hydroxy, or $(C_1$–$C_3)$alkyl,

(xiii) $(C_1$–$C_4)$hydroxyalkyl,

(xiv) $(C_1$–$C_4)$dihydroxyalkyl,

(xv) $(C_1$–$C_4)$trihydroxyalkyl,

with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl,

(b) cycloamino selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl optionally substituted by one or 2 $(C_1$–$C_{12})$alkyl of one to 12 carbon atoms, inclusive,

(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or $(C_1$–$C_4)$alkyl and R_{21} is other than hydrogen, but otherwise as defined above,

(d) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined in (c),

(4) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or $(C_1$–$C_4)$-alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$,

wherein Y_1 is trans—CH=CH—, cis—CH=CH—, CH_2CH_2—, or —C≡C—; and

wherein Z_2 is

(1) $—CH_2—(CH_2)_f—C(R_2)_2$, wherein R_2 is hydrogen or fluoro and f is zero, one, 2, or 3, or

(2) trans—CH_2—CH=CH—.

4,525,587

PROCESS FOR PREPARING A CEPHALOSPORIN COMPOUND

Ta-Sen Chou, and Perry C. Heath, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 453,445, Dec. 27, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,609

Int. Cl.[3] **C07D** *501/38;* **A61K** *31/565*

U.S. Cl. 544—025 **3 Claims**

1. In a process for preparing (6R,7R)-7-[(Z)-2-(2-triphenylmethylaminothiazol-4-yl)-2-(2-tert.-butoxycarbonylprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)-ceph-3-em-4-carboxylate by reacting a (Z)-2-(2-tert.-butoxycarbonylprop-2-oxyimino)-2-(2-triphenylmethylaminothiazol-4-yl)-acetyl hal-

ide with (6R,7R)-7-amino-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylic acid dihydrochloride, the improvement which comprises the steps of: (a) carrying out the reaction in N,N-dimethylacetamide and a water-immiscible organic solvent, (b) washing the reaction mixture with water, and (c) adding an organic counter-solvent selected from diethyl ether, methyl ethyl ether, diglyme, tetrahydrofuran, ethyl acetate or methyl acetate so as to produce a crystalline N,N-dimethylacetamide solvate.

4,525,588

CHROMOGENIC NAPHTHOLACTAMS

Rudolf Zink, Therwil, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

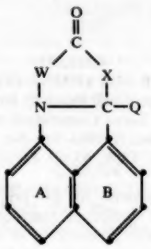
Filed Jun. 7, 1983, Ser. No. 502,039

Claims priority, application Switzerland, Jun. 14, 1982, 3666/82

Int. Cl.³ C07D *239/72, 265/12*

U.S. Cl. 544—89 **10 Claims**

1. A chromogenic naphtholactam of the formula



wherein

each of the rings A and B independently of the other is unsubstituted or substituted by halogen, lower alkyl, lower alkoxy, N,N-dilower alkylamino, N-lower alkyl-N-arylamino, acyl or acylamino,

X is oxygen or

wherein R is hydrogen, lower alkyl or aryl,

W is ethylene, cyclohexylene, or a benzene, naphthalene, pyridine, pyrazine or quinoline ring, or a benzene ring substituted by halogen, methyl or methoxy, and

Q is the radical of a couplable compound selected from the group consisting of a

N-monosubstituted or N,N-disubstituted aniline, a

N-monosubstituted or N,N-disubstituted naphthylamine, a

N-unsubstituted or N-substituted indole, indoline, carbazole, tetrahydrocarbazole, dihydroquinoline, tetrahydroquinoline, dibenzylimide and benzomorpholine, and

a phenol-lower alkyl ether,

a naphthol-lower alkyl ether,

a diphenylether and a phenylpyrazoline,

wherein such a radical of a couplable compound is C-unsubstituted or C-substituted by halogen, hydroxyl, cyano, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonyl or C_1–C_8-acyl and wherein the N-substituent is C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or benzyl, each of which is unsubstituted or substituted by halogen, nitro, hydroxyl, lower alkyl, lower alkoxy or lower alkoxycarbonyl.

4,525,589

ISOQUINOLINESULFONYL DERIVATIVES

Hiroyoshi Hidaka, 799-25, Kannonji-cho, Tsu-shi, Mie-ken; Takanori Sone, Nobeoka; Yasuharu Sasaki, Nobeoka, and Taisuke Sugihara, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Hiroyoshi Hidaka, both of, Japan

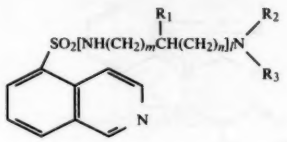
Division of Ser. No. 357,770, Mar. 12, 1982, Pat. No. 4,456,757. This application Jan. 20, 1984, Ser. No. 572,418

Claims priority, application Japan, Mar. 20, 1981, 56-399550; Jun. 1, 1981, 56-82559; Jun. 12, 1982, 57-2229; Jan. 14, 1982, 57-3291

Int. Cl.³ C07D *413/12*

U.S. Cl. 544—128 **8 Claims**

1. A compound of Formula (I):



wherein

l is zero or one;

m and n each is zero or an integer of one to nine;

m+n is an integer of at least one;

R_1 is a hydrogen atom, a $C_{1\text{-}10}$ alkyl group, a $C_{5\text{-}6}$ cycloalkyl group or a phenyl group;

R_2 and R_3 are independently $C_{1\text{-}6}$ alkylene groups and linked through an oxygen atom to form a 5- to 7-membered hetrocyclic ring with the adjacent nitrogen atom;

or the pharmaceutically acceptable acid addition salt thereof.

4,525,590

SIMPLIFIED PROCESS FOR THE PRODUCTION OF POLYAMINES BY THE ALKALINE HYDROLYSIS OF COMPOUNDS CONTAINING NCO-GROUPS

Werner Rasshofer, Cologne; Klaus König, Leverkusen; Holger Meyborg, Odenthal; Walter Meckel, Neuss, and Armin Zenner, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,493

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1981, 3129979

Int. Cl.³ C07D *251/34;* **C07C** *125/06, 127/24, 127/15*

U.S. Cl. 544—222 **14 Claims**

1. A process for the production of an aromatic and/or aliphatic primary polyamine containing a member selected from the group consisting of urethane, urea, biuret and isocyanurate groups which comprises

(a) converting a compound containing aromatic and/or aliphatic NCO-groups and a member selected from the group consisting of urethane, urea, biuret and isocyanurate groups into the corresponding carbamate by mixing said compound with a base derived from a Group IA, IIA or IIIA metal of the Periodic Chart of Elements and/or quaternary ammonium hydroxides in the presence of water,

(b) directly converting said carbamate into the corresponding free amine by hydrolyzing said carbamate with a strong acid selected from the group consisting of aqueous mineral acids, oxalic acid, formic acid and acetic acid, in a quantity equivalent to the quantity of said base and simultaneously converting any excess base into the corresponding acid salt and

(c) isolating the free amine.

4,525,591

2,4-DIOXOTETRAHYDROPYRIMIDO-(1,2-a)-BENZIMIDAZOLE SUBSTITUTED ISOINDOLINE DYES AND THEIR USE

Wolfgang Lotsch, Beindersheim; Reinhard Kemper, Heidelberg, and Ernst Schefczik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

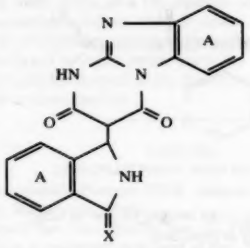
Filed Mar. 1, 1983, Ser. No. 470,946

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208218

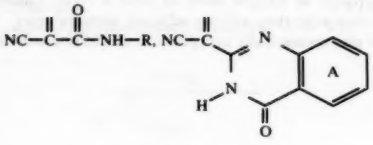
Int. Cl.[3] **C07D** *487/04;* **C09B** *57/04*

U.S. Cl. 544—250 **9 Claims**

1. An isoindoline dye of the formula



where X is a radical of the formula



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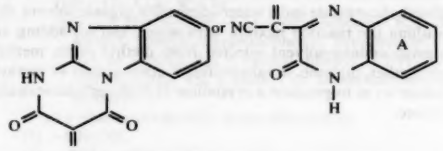


and R is hydrogen, C_1–C_4-alkyl, benzyl, phenyl, naphthl-yl or a heterocyclic radical, selected from the group consisting of thiazol-2-yl, benzothiazol-2-yl, 6-methoxybenzothiazol-2-yl and 1,2,4-triazol-3-yl and benzimidazol-2-yl and the rings A, the phenyl radical, the naphthyl radical and the heterocyclic radical in R may be further substituted by 1 to 3 non-solubilizing groups selected from the group consisting of halogen, alkyl and alkoxy, each of 1 to 6 carbon atoms, 1 to 2 nitro, trifluoromethyl, carbamyl, ureido, sulfamyl, cyano, alkoxycarbonyl, alkanoyl, n-alkylcarbamyl, n-alkylureido and alkanoylamino, each of 2 to 6 carbon atoms in total, alkylsulfonyl and alkylsulfamyl, each of 1 to 6 carbon atoms, phenoxycarbonyl, benzoyl, benzoylamino, phenylsulfonyl, n-phenylcarbamyl n-phenylsulfamyl, phenyl, and n-phenylureido.

4,525,592

PROCESS FOR SQUARAINE COMPOSITIONS

Kock-Yee Law, Fairport, and Frank C. Bailey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1983, Ser. No. 557,796

Int. Cl.[3] **C07C** *85/00, 85/02, 85/06*

U.S. Cl. 564—307 **16 Claims**

1. An improved process for the preparation of squaraine compositions which comprises reacting a dialkyl squarate, with an aniline, in the presence of an acid catalyst and an aliphatic alcohol, at a temperature of from about 60 degrees Centigrade to about 160 degrees Centigrade.

4,525,593

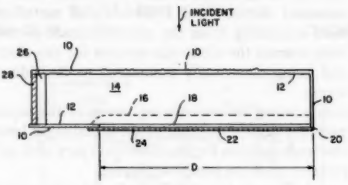
INVERTED, OPTICALLY ENHANCED SOLAR CELL

Eli Yablonovitch, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 16, 1984, Ser. No. 601,080

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 **11 Claims**



1. A solar cell comprising:

(a) an active material including a layer of crystalline silicon doped with one conductivity type dopant, a layer of SIPOS doped with the opposite conductivity type dopant deposited on at least one portion of the surface of said layer of crystalline silicon away from the incident light;

(b) a first metal contact fixed to said layer of SIPOS; and

(c) a second metal contact fixed to a portion of the edge of said layer of crystalline silicon, the region of said layer of crystalline silicon adjacent to said second metal contact being heavily doped with a greater concentration of said one conductivity type dopant than the remainder of said layer of crystalline silicon.

4,525,594

WAFER-SHAPED SOLAR CELL

Willi Pschunder, Ilsfeld, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,584

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303926

Int. Cl.³ H01L *31/04, 31/18*

U.S. Cl. 136—256 **16 Claims**

1. In a wafer-shaped semiconductor solar cell including a semiconductor wafer having a rear surface contact and conduction paths disposed on the surface of the solar cell wafer which receives the incident light and to which at least one metallic connector member is connected for interconnection of the solar cell with further solar cells, with said at least one connector member being connected, at several spaced points in an electrically conductive and mechanically fixed manner to said conduction paths; the improvement wherein a plurality of connector member portions which are arranged horizontally in one row are attached to said conduction paths, with each said connector member portion being secured to the conduction path at one end only, and having its detached end overlapping the preceding connector member portion in the row in imbricated relationship, whereby said solar cell can be divided into several smaller solar cells with each individual said smaller solar cell being already provided with at least one connector member protruding beyond the resulting wafer edge.

4,525,595

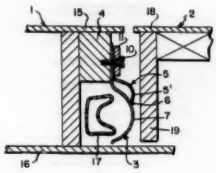
RADIATION RESISTANT CLOSURE

Robert W. Harriman, Milford, Conn., assignor to Keene Corporation, Norwalk, Conn.

Filed May 4, 1983, Ser. No. 491,399

Int. Cl.³ H05K *9/00*

U.S. Cl. 174—35 GC **5 Claims**



1. A radiation resistant joint between a movable member and a fixed member comprising first and second resiliently electrically conductive contact fingers each having a bowed portion, a fixed end and a free end with the fixed end of said second finger in overlapping relationship with the fixed end of the first finger and with both ends fixed to one of said members and with both fingers extending in the same direction and with the free end of said second finger overlapping and engaging the bowed portion of the first finger, and a conductive plate on the other said member adapted to engage the bowed portion of both said fingers.

4,525,596

DAMPING SPACER FOR BUNDLE CONDUCTORS OF HIGH-VOLTAGE ELECTRIC LINES, WITH IMPROVED DAMPING EFFECTIVENESS

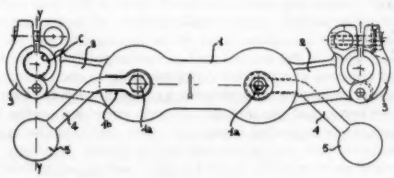
Giorgio Diana, Milan, Italy, assignor to A. Salvi & C. S.p.A., Milan, Italy

Filed Nov. 29, 1983, Ser. No. 556,046

Claims priority, application Italy, Nov. 30, 1982, 24501 A/82

Int. Cl.³ H02G *7/14, 7/12*

U.S. Cl. 174—42 **6 Claims**

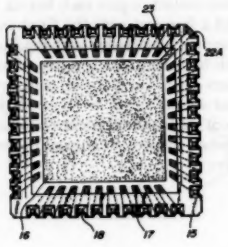


1. Damping spacer for bundle conductors of high-voltage electric lines comprising a stiff central body and at least two connecting clamps, each for anchoring to a respective sub-conductor of the bundle, each clamp having a rigid extension connected, through at least one springing or elastically deformable hinge element, to said stiff central body, characterized in that, inertial masses are rigidly associated to said central body, the barycenters of the masses being far from the barycenter of the central body.

4,525,597
CERAMIC LEADLESS PACKAGES AND A PROCESS FOR MANUFACTURING THE SAME

Shozo Abe, Tsuru, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Oct. 24, 1983, Ser. No. 544,851
Claims priority, application Japan, Oct. 30, 1982, 57-190945
Int. Cl.³ H01L *23/04, 23/50*
U.S. Cl. 174—52 FP 5 Claims



1. A ceramic leadless package comprising a ceramic substrate having first and second opposite surfaces parallel to each other, a plurality of ceramic projections protruding from the first surface and separated from each other, a metallized layer provided on the end surface of each of the ceramic projections, an electrode portion for an electronic device provided on the central portion of the second surface so as to mount the electronic device thereon, a plurality of metallized layers extending from the circumference of the ceramic substrate toward the electrode portion for the electronic device, a side metallized layer connecting each metallized layer of the first surface to the corresponding each metallized layer of the second surface, wherein the metallized layer of the first surface and the metallized layer of the second surface correspondingly are convex and concave at a position corresponding to each ceramic projection and are connected to each other through the side metallized layer, and the metallized layers provided on the second surface are separated from each other and extend toward the electrode portion for the electronic device provided on the central portion of the second surface, and the metallized layers existent in the concave portions and a greater part of the metallized layers extending toward the center of the second surface are covered with an insulating layer.

5. A process for manufacturing a ceramic leadless package which comprises steps of:

punching a ceramic green sheet at predetermined positions to form through-holes for side metallized layers corresponding to a ceramic leadless package unit;

printing the inner circumferential surface of each of the through-holes with a metallizing paste to form a side metallizing layer;

screen-printing a first surface of the ceramic green sheet with a metallizing paste to form a plurality of metallizing layers for connecting to an external electronic circuit, each extending from the circumference of the through-hole and being electrically connected to the side metallizing layer and at the same time screen-printing a second surface of the ceramic green sheet with a metallizing paste to form an electrode portion for an electronic part to be mounted thereon and a plurality of metallizing layers, each extending from the circumference of the through-hole toward the electrode portion for the electronic part and being electrically connected to the side metallizing layer;

screen-printing the metallizing layers of the second surface except a desired portion of the metallizing layer near the electrode portion for the electronic part with an insulating paste to form an insulating layer;

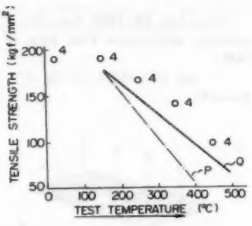
hot-pressing only a region including the through-hole and a part of the insulating layer adjacent thereto up to a given depth to protrude a part of each metallizing layer from the first surface of the ceramic green sheet; and

firing and plating the resulting pressed product.

4,525,598
STEEL WIRE FOR USE IN STRANDED STEEL CORE OF AN ALUMINUM CONDUCTOR, STEEL REINFORCED AND PRODUCTION OF SAME

Takashi Tsukamoto; Chuzo Sudo; Kenji Aihara, and Syozi Nishimura, all of Kitakyushu, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 20, 1982, Ser. No. 435,413
Claims priority, application Japan, Jan. 12, 1982, 57-3607; Jan. 12, 1982, 57-3608; Jan. 21, 1982, 57-8605; Jan. 22, 1982, 57-9290; Jul. 22, 1982, 57-126660
Int. Cl.³ H01B *5/08, 1/02*
U.S. Cl. 174—128 R 4 Claims



1. In an aluminum conductor, steel reinforced, including a stranded steel wire core, the improvement wherein the stranded steel core includes a galvanized high strength steel wire which consists, by weight, essentially of:

C: 0.4–1.2%,
Mn: not more than 2.0%,
Cr: 0–5.0%,
Ni: 0–1.0%,
Nb: 0–0.2%,
Zr: 0–0.2%,
Si: an amount effective to improve fatigue properties and high temperature strength and not more than 2.0%,
Al: not more than 0.1%,
Cu: 0–1.0%,
V: 0–0.5%,
Ti: 0–0.2%,

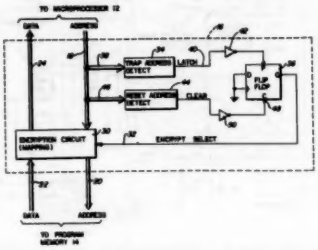
with the balance iron with incidental impurities of which the amounts of P, S, N and oxygen are:

P: not more than 0.025%,
P+S: not more than 0.03%,
S: not more than 0.015%,
N: not more than 0.010%, and
Oxygen: not more than 0.004%.

4,525,599
SOFTWARE PROTECTION METHODS AND APPARATUS

Kevin G. Curran, Sudbury; Steven E. Golson, Wayland, and Christian S. Rode, Cambridge, all of Mass., assignors to General Computer Corporation, Cambridge, Mass.

Filed May 21, 1982, Ser. No. 380,771
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 **27 Claims**



17. A method for inhibiting the use of a microprocessor emulator to read digital program data stored in memory means in a computer system, comprising the steps of:

(a) storing encrypted digital program data into preselected address locations of memory means;

(b) coupling address and data buses of the microprocessor to the memory means through protection circuit means for encrypting, decrypting and monitoring the addressing of the program data stored in the memory means;

(c) monitoring at least one of the address and data buses to detect an attempted invalid accessing of the memory means, the invalid accessing operation being characterized by an operation not occurring during normal execution of the program; and

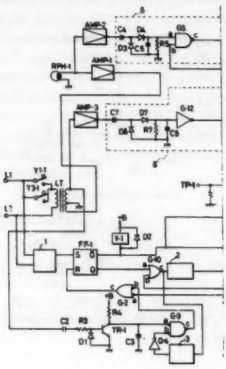
(d) returning falsely decrypted program data through the protection circuit means to the microprocessor emulator in response to the detection of the invalid accessing operation.

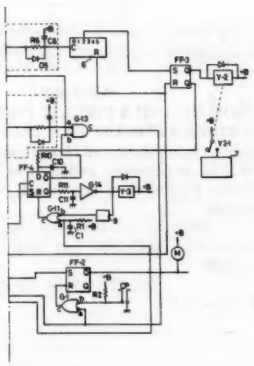
4,525,600
AUTOMATIC TELEPHONE ANSWERING DEVICE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corportion, Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,214
Claims priority, application Japan, Mar. 5, 1982, 57-34747
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—6.02 **5 Claims**

1. An automatic telephone answering device having an outgoing message tape and an incoming message tape, characterized in that said automatic telephone answering device comprises: an outgoing message tape in which a speed calling signal for dialling a greater length telephone number of a subscriber or a paging signal for paging a remote subscriber followed by prerecorded messages is stored; switching means for switching from said outgoing message tape to said incoming message tape; memory means for storing information indicating that said incoming message tape has been driven; reengaging means for reengaging a loop circuit by said memory means after said automatic telephone answering device is restored to a standby mode; detecting means for detecting a dial tone which is generated after said loop circuit is reengaged; and driving means for driving said outgoing message tape by said dial tone detecting means; whereby a specific signal stored





in said outgoing message tape is delivered automatically onto a telephone line.

4,525,601
TELEPHONE CALL ACCOUNTING SYSTEM

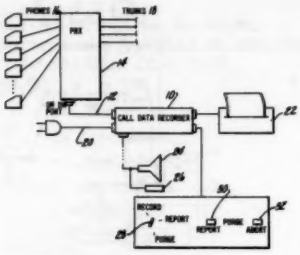
Richard G. Barnich, 6197 Hereford Rd., Saline, Mich. 48176; Michael H. Ferguson, 1455 Marlborough, and Charles K. McGregor, both of Ann Arbor, Mich. 48104

Filed Dec. 13, 1983, Ser. No. 561,154
Int. Cl.³ H04M *15/16, 15/32*
U.S. Cl. 179—7 MM **13 Claims**

6. A method of costing telephone calls from any of a first plurality of telephone sets having one copmbination of an area code and exchange number to any of a second plurality of telephone sets having a different combination of an area code and exchange number, each combination of an area code and exchange number being associated with a unique geographic area, comprising the steps of:

(a) precomputing distance from the geographic area associated with said one combination to the geographic area

associated with each of the different combinations of area codes and exchange numbers; and



(b) calculating the cost of the calls using the distances precomputed in step (a).

4,525,602

METHOD OF AND A CIRCUIT FOR ENERGIZING A SUBSCRIBER'S CIRCUIT IN A TELEPHONE SYSTEM

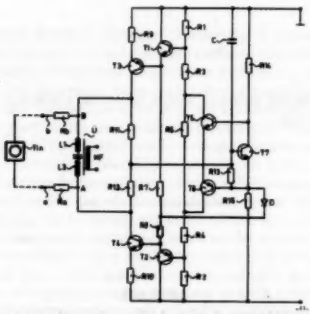
Joerg Robra, Heroldsberg, and Hans Goschin, Nuremberg, both of Fed. Rep. of Germany, assignors to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH, Nuwenbweg, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,979

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138649

Int. Cl.³ H04M *19/00*

U.S. Cl. 179—16 F **6 Claims**



1. A method of energizing a subscriber's circuit in a telephone system having two separate constant-current sources each connected to a respective subscriber circuit line to supply constant current to the circuit lines irrespective of their length, comprising the steps of measuring current differences between the lines by a shunt, applying to at least one of said constant-current sources a reference voltage produced in response to voltage drops across said shunt to compensate for current difference between the lines by increasing via regulating device current in the respective subscriber line to a predetermined maximum value, and after the current in the circuit exceeds said predetermined value, inactivating the regulating device and decreasing the reference voltages in respective current sources.

4,525,603

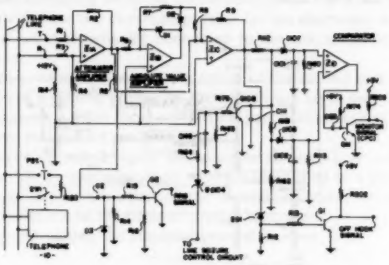
RING AND LINE MONITOR FOR ANSWERING MACHINE

Raymond G. Bond, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Filed Jan. 3, 1984, Ser. No. 567,675

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—84 R **2 Claims**



1. In combination: a telephone answering system adapted to be connected to telephone line and which includes control circuitry for deactivating the telephone answering system when a change in line voltage on the telephone line exceeds a predetermined differential; and a telephone adapted to be connected to the telephone line and including resistance means and a switch series connected across the telephone line, said switch being closed when the telephone is picked up to place said resistance means across the telephone line thereby causing a change in the line voltage of the telephone line in excess of said predetermined differential when the telephone line is picked up, and a further switch connected in series with said first-named switch and said resistance means for preventing said change in line voltage when the telephone is picked up and said further switch is open.

4,525,604

HORN LOUDSPEAKER WITH CONVEX DIAPHRAGM

Kent Frye, Buchanan, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

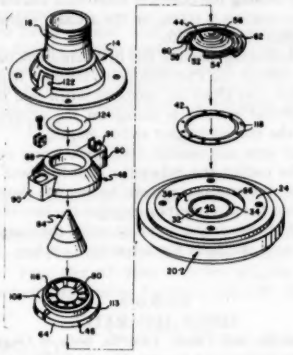
Filed Jun. 7, 1983, Ser. No. 502,011

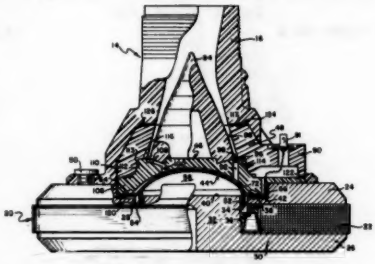
Int. Cl.³ H04R *9/00, 1/28, 1/30*

U.S. Cl. 179—115.5 H **10 Claims**

1. A driver for a loudspeaker comprising, in combination, a base, a diaphragm mounted on the base for vibratile motion with respect to the base, said diaphragm having a dome symmetrical about a central axis and having a periphery extending about the dome, a plate mounted on the base having a recess extending therein and forming a surface symmetrical about a central axis coincident with the central axis of the diaphragm, said plate being acoustically sealed to the base about the diaphragm, said diaphragm and plate forming a cavity between the surface of the recess and the diaphragm, said plate having a plurality of channels extending therethrough and communicating with the cavity, a member mounted on the base having a passageway extending therethrough from the base, the plate being disposed within said passageway and tapering inwardly from the base, the channels of the plate communicating with the passageway of the member, a plug disposed within the passageway of the member having a surface at one end mating with and abutting a surface of the plate, said plug extending from the plate and tapering inwardly from the plate, said plug being spaced from the member forming an opening between the plug and the member for transmitting sound, wherein the plate is provided with a first aperture located on the surface of the recess adjacent to the periphery of the dome of the diaphragm, said plate having a first channel extending from the first aperture through the plate along an axis parallel to the axis of symmetry of the recess to a first opening communicating with the said channel, said plate having a second aperture

located on the surface of the recess closer to the axis of symmetry of the recess than the first aperture, said plate having a second channel extending from the second aperture through the plate along an axis parallel to the axis of symmetry of the





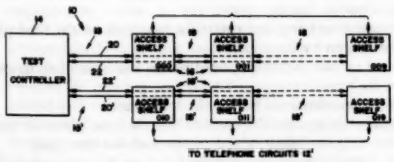
recess to a second opening, a third channel extending from the second opening of the plate along the abutting surfaces of the plug and plate to the perimeter of the plug, said third channel communicating with the sound channel.

4,525,605

SYSTEM FOR ACCESSING ELECTRICAL CIRCUITS AND RELAY SWITCH THEREOF

Ruben Wever, San Jose; Lorin D. Allred, Sunnyvale, and Marco A. Ruiz, Milpitas, all of Calif., assignors to Wiltron Company, Mountain View, Calif.

Filed Dec. 8, 1982, Ser. No. 447,753
Int. Cl.³ H04M *3/32*
U.S. Cl. 179—175.2 R **43 Claims**



1. A system for accessing a plurality of electrical circuits, the electrical circuits including two-wire, four-wire or six-wire circuits or a combination thereof, comprising:

(a) a common access test bus;

(b) a common control bus;

(c) a plurality of access shelves for connecting the electrical circuits to said common access test bus, each of said plurality of access shelves being individually selectively controllable to connect the plurality of electrical circuits to said common access test bus in response to control signals on said common control bus; and

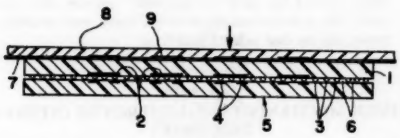
(d) at least one test controller each having programmed data processing means for selectively generating the control signals onto said common control bus to individually and directly control any one of said plurality of access shelves, said common access test bus and said common control bus being connected to said one test controller and to said plurality of access shelves.

4,525,606

SENSOR SWITCH

Ryoichi Sado, Oaza Kobari Shinjuku 69-7, Ina-cho, Kita-adachi-gun, Saitama-ken, Japan

Filed Jan. 28, 1983, Ser. No. 462,071
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—5 A **32 Claims**



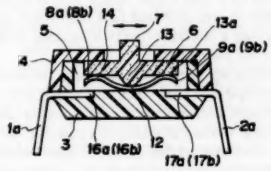
1. A sensor switch, comprising: a printed circuit base board provided on one side surface thereof with at least a pair of stationary contacts, and a flexible sheet member made of a rubber-like elastic material having a rubber hardness of 20 to 100 according to Physical Testing Methods for Vulcanized Rubber which is approved as Japanese Industrial Standard (hereafter, referred to as JIS K 6301) and provided on one side surface thereof with at least a movable contact face having a rubber-like elasticity and provided with a plurality of columnar protrusions made of an electrically insulating pliable rubber-like elastic material and so piled on said printed circuit base board that said movable contact face is faced to said stationary contacts with a space maintained by said protrusions, each of said protrusions being 10 to 70 in rubber hardness (JIS K 6301), 0.05 to 0.5 mm in height and 0.1 to 2 mm in diameter and being arranged adjacent each other with a spacing of 0.1 to 5 mm.

4,525,607

SIMPLIFIED ELECTRIC SWITCH CONSTRUCTION

Yasutaka Senoh, 1783 Nippa-cho, Kohhoku-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jan. 3, 1984, Ser. No. 567,700
Claims priority, application Japan, Feb. 4, 1983, 58-17947; Feb. 4, 1983, 58-17948
Int. Cl.³ H01H *15/02*
U.S. Cl. 200—16 R **3 Claims**



1. A simplified electric switch comprising:

an insulating base,

a switch cover mounted on the base, said cover and said base defining a central space therebetween,

opposing internal leads to which the terminals are bonded, the internal leads being mounted on the base,

a rocking type movable contact element, mounted within said central space, in the form of an electrically conductive plate and having a curved belly portion, reversely bent shoulder portions at opposite sides of the belly portion, and pointed contact ends, each shaped into a pyramid, located at both ends of the contact element, the belly portion being centrally provided with a projection, the contact element being mounted with said projection sitting on said base so as to be able to rock on said base, and

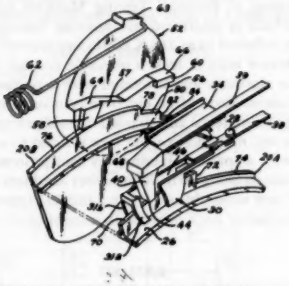
a push member having a protrusion engaging the curve of said belly portion from the side opposite said base, the push member further having an arm held for sliding movement between a shoulder portion and the lower surface of the switch cover, whereby movement of the push member toward one of said shoulder portions forces the protrusion to move along the belly portion and to flex said one shoulder portion toward said base thereby bringing the contact ends carried by said one shoulder portion into contact with the corresponding internal leads and exciting the terminals on one side of said base.

4,525,608

TIMER MECHANISM WITH IMPROVED INTERVAL ACCURACY

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 3, 1982, Ser. No. 446,444
Int. Cl.[3] H01H *43/10*; F16H *5/40, 3/74*
U.S. Cl. 200—38 R **7 Claims**



1. A timer comprising:

a control cam having a first and second cam track;

said second cam track having three arcuate segments of progressively shorter fixed radius lengths defining a three step cam track profile;

drive means for rotating the control cam about an axis;

switch means comprising first and second resilient arms carrying opposing contacts and extending generally adjacent said first cam track, said first arm extending between said second arm and said first cam track and said second arm having a lateral projection member in the direction of the second cam track;

a cam-following member extending between said second arm and said first cam track and biased into cam-following engagement with said first cam track by said second arm;

a rocker arm having at one end a cam-follower portion and at the other end a lifter portion, said rocker arm having a pivot point between the ends thereof and spring biased to force the cam-follower portion into cam-following engagement with the second cam track;

said cam-following member and first cam track being operative to prevent closing the contacts when said rocker arm cam-follower portion is riding on the arcuate segment having the longest radius length;

said cam-following member and first cam track being operative to release the cam-following member from the first cam track and support the first arm on the rocker arm and prevent closing the contacts when said rocker arm cam-follower portion is riding on the arcuate segment having the longest radius length;

said cam-following member and first cam track being operative to release the cam-following member from the first cam track and close the contacts when said rocker arm cam-follower portion is riding on the arcuate segment having the second longest radius length;

said rocker arm and second cam track being operative to pivot the rocker arm when the cam follower portion is riding on the arcuate segment having the shortest radius length and the lifter portion engages the lateral projection member of the second arm and opens the contacts; and

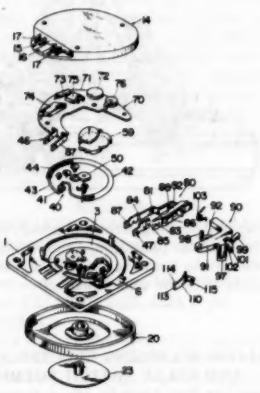
means to reset the timer for subsequent cycling.

4,525,609

TIMER APPARATUS

Akio Matsumoto, and Takao Yamada, both of Osaka, Japan, assignors to Matsushita Electric Co., Ltd., Osaka, Japan

Filed Nov. 9, 1983, Ser. No. 550,294
Claims priority, application Japan, Nov. 10, 1982, 57-197997
Int. Cl.[3] H01H *7/00*
U.S. Cl. 200—38 R **7 Claims**



1. A time switch driven by an electric clock motor comprising:

a base plate provided with an input terminal, an output terminal, and the clock motor comprising a rotor which is a bipolarized permanent magnet rotatably journaled on the base plate and an electromagnet ring, said rotor being disposed below the base plate;

a time dial overlying and rotatably mounted on the base plate to be driven by the motor;

electrical circuit means disposed below the base plate to energize the motor;

switch means disposed below the base plate;

a reduction gear train disposed below the base plate for interconnecting the rotor of the motor and the time dial;

switch activating means disposed below the base plate for opening and closing the switch means;

at least one on-tripper mounted on the time dial to be movable therewith so as to operate the switch activating means to open the switch means when it comes into contact with the switch activating means;

at least one off-tripper mounted on the time dial to be movable therewith so as to operate the switch activating means to

close the switch means when it comes into contact with said switch activating means;

said electromagnet ring being composed of a ring core interrupted by a gap within which said rotor is disposed and a coil would therearound said ring core;

said base plate having an annular groove for receiving therein said electromagnet;

said groove being coaxial with said time dial and having a diameter slightly smaller than that of the dial; and

the components for the electrical circuit means, the switch means, the switch activating means, and the reduction gear train being arranged substantially in the same plane parallel to the base plate.

4,525,610

QUICK MAKE AND BREAK PLUG AND SOCKET CONNECTOR

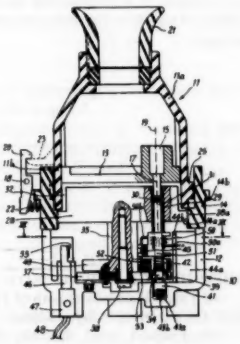
Yves Le Magourou, Ermont, France, assignor to Societe d'Exploitation des Procedes Marechal, Paris, France

Filed Oct. 17, 1983, Ser. No. 542,394

Claims priority, application European Pat. Off., Oct. 21, 1982, 82 401934.3

Int. Cl.³ H01R *33/28*

U.S. Cl. 200—51.13 **18 Claims**



1. A quick make and break electrical connector comprising:

(a) a plug including an insulating body portion and a plurality of plug connector-pins, said body portion comprising means for positioning said plug connector-pins within said plug, said body portion being rigidly mounted within said plug;

(b) a socket having a body portion including means for receiving at least one input terminal of an electrical power supply line, and an insulating block rotatably mounted within said body portion, said insulating block having a plurality of bores therein, a socket connector-pin being slidably positioned within each of said bores, and resilient means for biasing each of said socket connector-pins into engagement with a respective plug connector-pin, wherein said plug and socket are adapted to be rotatably interengaged such that said plug connector-pins rotate together with said insulating block;

(c) means for guiding said plug during rotation of said plug within said socket and during axial movement of said plug within said socket, and means for locking said plug in a fixed position with respect to said socket; and

(d) a first contact stud attached to each of said input terminals and a respective second contact stud being attached to the end of a conducting arm which is rigidly attached to each of said socket connector-pins, each of said conducting arms being pivotable about a lower end of each of said insulating block bores, wherein an electrical connection between each input terminal and a corresponding socket connector-pin is established by coupling respective first and second contact studs, said first and second contact studs occupying different relative angular positions with respect to a central axis of said socket when said plug and socket are not interengaged, said apparatus further comprising means for rotating said studs into a position of angular coincidence.

4,525,611

FLUID PRESSURE SWITCH

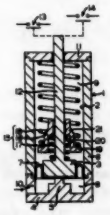
Osamu Akamatsu, Akashi, and Masaaki Kitaue, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 24, 1983, Ser. No. 478,576

Claims priority, application Japan, Mar. 24, 1982, 57-47885

Int. Cl.³ H01H *35/40*

U.S. Cl. 200—83 R **16 Claims**



1. A fluid pressure device for operating two or more switch devices upon the detection of two or more distinct fluid pressure levels from a varied range of fluid pressure, said fluid pressure device comprising:

(a) a housing having a cylindrical bore formed therein, said housing further having a pressure inlet communicating with said cylindrical bore;

(b) a piston member axially movable within said cylindrical bore;

(c) a piston rod extending from said piston member and moving therewith, said piston rod having an external portion extending through an opening formed in said housing;

(d) spring means axially surrounding said piston rod for opposing movement of said piston member, said spring means having a spring coefficient which is nonlinear and which changes by at least one increment in response to a predetermined displacement of said piston member, said spring means including a plurality of springs serially arranged surrounding said piston rod;

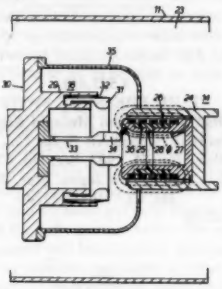
(e) switch operating means disposed externally of said housing and operably connected to said external portion of said piston rod for selectively operating the switch devices; and

(f) limiting means cooperatively engaging said spring means for independently limiting axial compression of said spring means, and, said limiting means having a middle body member disposed between said first and second spring members such that said first spring member becomes caged by said middle body member upon said piston member reaching a first predetermined piston displacement, said middle body member having a narrow guide end in surrounding proximity to said piston rod, said narrow guide end, upon said piston member reaching a second predetermined piston displacement, contacting a portion of said housing such that said middle body member is rigidly supported by said housing portion.

4,525,612
GAS INSULATED SWITCH

Kazue Kawashima, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 24, 1983, Ser. No. 497,716
Claims priority, application Japan, May 24, 1982, 57/87428
Int. Cl.³ H01H *33/18*
U.S. Cl. 200—147 R **3 Claims**



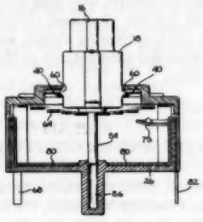
1. A gas insulated switch comprising:
a tank filled with an insulating gas;
first and second contacting parts disposed opposite each other within said tank and each including respectively first and second main current-carrying contactors and first and second arc electrodes installed respectively within said first and second main current-carrying contactors, said first and second main current-carrying contactors disposed opposite each other and adapted for relative movement therebetween such that said first and second main current-carrying contactors freely make contact with or move apart from each other, said first and second arc electrodes disposed opposite each other such that said first and second arc electrodes also freely make contact with or part from each other in accordance with the relative movement of said first and second main current-carrying contactors;
said second arc electrode defining opposite ends, and including a ring-shaped arc-proof piece arranged at one end thereof, an arc drive coil disposed adjacent to said arc-proof piece and electrically connected thereto at one end thereof, and an end ring disposed adjacent said coil and electrically connected to an opposite end thereof; and
said first and second arc electrodes extending exterior of said respective first and second main current-carrying contactors and shaped such that when an electrical connection is made between said first and second arc electrodes, said first arc electrode makes contact with said end ring of said second arc electrode, and such that when said arc electrodes are opened, an arc is generated between said first arc electrode and said ring-shaped arc-proof piece of said second arc electrode producing a current in said drive coil which generates a magnetic flux acting substantially perpendicular to said arc to extinguish said arc.

4,525,613
SPIRAL SPRING KEYBOARD SWITCH WITH HAIRPIN SPRING TACTILE FEEDBACK

Gary C. Butts, Huntington Beach, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 20, 1984, Ser. No. 572,259
Int. Cl.³ H01H *13/54*
U.S. Cl. 200—159 R **10 Claims**

1. An improved key switch assembly, comprising:
a housing including a base;
a first electrical contact secured to said housing;
spring means secured to said housing, said spring means including a second electrical contact;
actuator means abutting said spring means including a keystem for deforming said spring means in response to the depression of said key by a user, the deformation of said spring means forcing said second electrical contact into contact with said first electrical contact;

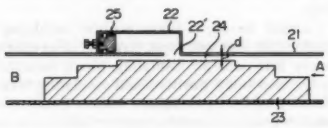


said keystem including at least one cam nub extending outwardly from said keystem;
said housing including a snap action hairpin cam spring disposed around said keystem, said hairpin cam spring being deformed in a snap action by said cam nub upon depression of said key, thereby providing tactile feedback to said user.

4,525,614
ABSORBER DEVICE FOR MICROWAVE LEAKAGE

Ken Ishino, and Yasuo Hashimoto, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,256
Claims priority, application Japan, May 28, 1982, 57-89873; May 31, 1982, 57-79007[U]; May 31, 1982, 57-79008[U]; May 31, 1982, 57-79009[U]; May 31, 1982, 57-79010[U]
Int. Cl.³ H05B *6/76*
U.S. Cl. 219—10.55 D **21 Claims**

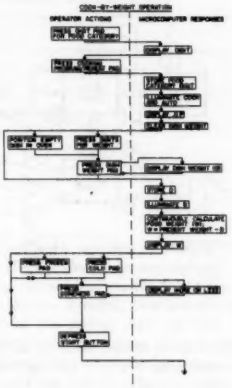


1. A microwave apparatus, comprising:
a main body with an opening;
a door coupled with the main body for closing said opening such that a leakage path exists at the interface between the periphery of the opening and the door;
a wave absorber device disposed adjacent said leakage path, said wave absorber device including an empty choke cavity having a length of approximately a quarter wavelength, said choke cavity being closed on at least three sides and having an entrance facing said leakage path;
a cover means comprising a flat plate closing said entrance, said cover means being formed of a mixture of ferro-magnetic material and dielectric material, said mixture having a dielectric constant less than 15.

4,525,615
METHOD FOR MICROWAVE DEFROSTING

Alvin D. Wyland, Williamsburg, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 16, 1984, Ser. No. 571,158
Int. Cl.[3] H05B 6/68
U.S. Cl. 219—10.55 M 10 Claims



1. The method of defrosting a food body in a microwave oven, comprising the steps of:

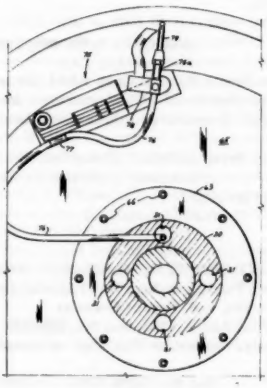
providing microwave energy at maximum power of said oven until the surface temperature of said food body rises to approximately 110° F.; and

providing microwave energy in a sequential step at a predetermined power level reduced from said maximum power to maintain said surface temperature of said food body at approximately 110° F. until said food body is defrosted.

4,525,616
INTERNAL PIPE WELDING APPARATUS

Clyde M. Slavens, Houston, Tex., assignor to Evans Pipeline Equipment Company, Houston, Tex.

Filed Jan. 3, 1984, Ser. No. 567,738
Int. Cl.[3] B23K 9/225
U.S. Cl. 219—60 R 18 Claims

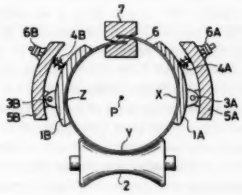


1. Internal pipe welding apparatus, comprising central shaft means, a pair of non-rotatable tubular hub means each disposed around a different end of said central shaft means, each said hub means including a central passage and wall means surrounding said central passage, one of said hub means having a plurality of circularly spaced passages through its said wall from end to end radially outwardly of and parallel to its said central passage, transverse plate means mounted rotatably around said central shaft means between the inner ends of said hub means, means for rotating said transverse plate means about said central shaft means, and at least one welding head means carried by said transverse plate means and rotatable therewith about said central shaft means, whereby said welding heads may be moved along the abutment between two abutted pipe ends to weld said pipe ends together at their interiors.

4,525,617
METHOD AND APPARATUS FOR AUTOMATIC ELECTRIC SEAM RESISTANCE WELDING OF CAN BODIES

Akihiro Saito, Ebina, Japan, assignor to Fujikogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 333,337, Dec. 22, 1981, abandoned.
This application Oct. 3, 1984, Ser. No. 657,058
Claims priority, application Japan, Dec. 24, 1980, 55-183172
Int. Cl.[3] B23K 11/06
U.S. Cl. 219—83 6 Claims

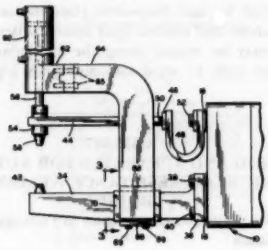


1. A method of automatic electric seam resistance welding of a thin-walled cylindrical can body, the method having the steps of inserting both side ends of a cylindrical can body blank into guide grooves of a guide rail having a Z-shaped cross section for overlapping said side ends; conveying the cylindrical can body blank into an electrode station for seam welding; and welding the overlapped side ends at a high welding speed; the improvement comprising that the step of welding the overlapped side ends is performed at a rate which is at least 40 m/min, and that during the step of conveying the cylindrical can body blank into the electrode station, there is provided the further step of holding the cylindrical can body blank by a holding device comprising segments, each of which has at least one pair of contacting concave members, each of said contacting concave members being pivotable about a stationary pivot pin positioned parallel to, and at a predetermined distance from, a center axis of the cylindrical can body blank, a line between said center axis and said pivot pin intersecting the concave profile of said concave member such that a first portion of the concave member contacts the cylindrical can body blank on one side of said line and a second portion of the concave member contacts the cylindrical can body portion on the other side of said line, and each contacting concave member being provided with an elastic means for limiting pivotal movement of said contacting concave member, whereby movement of said first portion of the concave member toward said center axis results in movement of said second portion of the concave member away from said center axis and vice versa so that shaking of said cylindrical can body blank is diminished and absorbed by said pivotal movement to keep said center axis of said cylindrical can body blank stably at a predetermined position and so that both the side ends come into light contact with the corresponding bottoms of the guide grooves.

4,525,618
RESISTANCE WELDING APPARATUS

Donald J. Beneteau, 1333 Front Rd. South, Amherstburg, Ontario, Canada

Filed Oct. 26, 1983, Ser. No. 545,477
Int. Cl.³ B23K *11/00*
U.S. Cl. 219—89 **8 Claims**



6. Apparatus for resistance welding comprising a transformer having an input face and an output face, a first output terminal block having a substantially planar surface at one portion of said output face and positioned close to and substantially parallel with said output face, a second output terminal block having a substantially planar surface at another portion of said output face and positioned close to and substantially parallel with said output face, said first output terminal block having at least two threaded holes located symmetrically with respect to a vertical center line of said first block, said second terminal block having at least two pair of threaded holes located symmetrically with respect to the vertical center line of said first block, a first welding electrode holder, a U-shaped shunt connecting an end portion of said first electrode holder and said first terminal block and enabling movement of said first electrode holder relative to said transformer, a second welding electrode holder electrically connected to said second output terminal block and positioned generally parallelly to said first electrode holder, a pressure intensifier cylinder, said cylinder having a piston rod connected to said first electrode holder for moving a first electrode carried thereby toward and away from a second electrode carried by said second electrode holder, and supporting arms supporting said pressure intensifier cylinder and adjustably affixed along said second electrode holder whereby said pressure intensifier cylinder can be moved along said second electrode holder to align the first and second electrodes.

4,525,619
AUTOMATIC WELD LINE FOLLOWING METHOD

Eizo Ide, and Hiroshi Fujimura, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

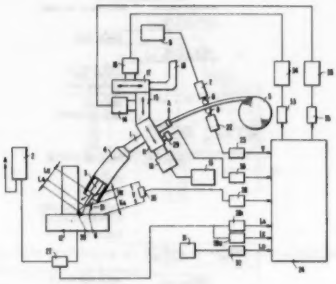
Continuation-in-part of Ser. No. 548,423, Nov. 3, 1983, abandoned. This application Jul. 24, 1984, Ser. No. 634,120
Claims priority, application Japan, Nov. 9, 1982, 57-195248
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—124.22 **1 Claim**

1. In an arc welding method for welding a work by feeding a consumable electrode toward the weld line of said work through the tip of a welding torch and by oscillating said welding torch, a method for automatically following said weld line comprising the steps of:

detecting average and effective values of a welding current, a consumable electrode feeding speed and a voltage between said tip and said work;

arithmetically processing the detected quantities by means of a computer to determine a distance L ($L \simeq L_E + L_A$) between said tip and a weld metal which is equal to the sum of an arc length L_A and the extension L_E of said consumable electrode extending from the tip of said welding torch;

detecting the deviation between the oscillation center of said welding torch and the center of a joint, which is constructed of said work, from the difference in said distance L between said tip and said weld metal in at least two predetermined oscillation positions; and



controlling the position of said torch at all times so that the positional relationship between said oscillation center and said joint center corresponds to a predetermined relationship, whereby an arc point can automatically follow said weld line.

4,525,620
METHOD OF WELDING FERRITIC AND AUSTENITIC STAINLESS STEELS AND PRODUCT THEREOF

Harry E. Deverell, Natrona Heights, and Jack M. Beigay, Freeport, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Sep. 15, 1982, Ser. No. 418,315
Int. Cl.³ B23K *9/23*
U.S. Cl. 219—137 WM **18 Claims**

1. In a method of welding ferritic stainless steel to austenitic metal alloy to form a welded article, the ferritic steel having 17 to 35% chromium and the austenitic steel having about 16 to 29% chromium, the ferritic steel containing a total carbon and nitrogen content less than the total carbon and nitrogen content of the austenitic steel, and the weld deposit containing titanium and columbium as stabilizing elements, the improvement comprising:

providing the weld deposit with at least 0.5% up to about 4.0% of stabilizer selected from the group consisting of titanium and columbium, and

providing at least 0.8% stabilizer when the weld deposit contains less than about 22% chormium or less than about 30% total of chromium and three times the molybdenum content;

said stabilizer being sufficient to stabilize the carbon and nitrogen of the weld deposit to provide a corrosion-resistant welded article.

4,525,621
ELECTRONIC WELDING ENERGY SOURCE

Peter Puschner, Vaalserquartier, Gut Fuchstal Dreiländerweg 127, 5100 Aachen, Fed. Rep. of Germany

Filed Jan. 3, 1983, Ser. No. 455,010
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1982, 3200086
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—137 PS **6 Claims**

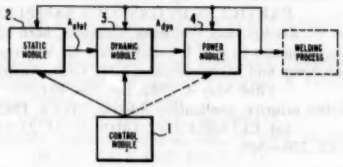
5. A method of controlling the energization of an electrically energized arc welding process comprising the following steps:

A. comparing a signal indicative of the power input voltage

of the welding process with a reference signal to develop a static function signal;

B. modifying the static function signal by integration over a predetermined time period to develop a dynamic function signal which varies in accordance with both dynamic and static conditions of the welding process,

step B being carried out via circuit means affording independently adjustable time constants for signals of increasing and decreasing amplitude; and



C. varying the current supplied to the welding process as a function of the dynamic function signal;

step C being carried out via the following sub-steps:

C1. comparing the dynamic function signal with a signal indicative of the power input current of the welding process to develop a current control signal; and

C2. varying the current supplied to the welding process as a function of the current control signal.

4,525,622

CERAMIC GLOW PLUG

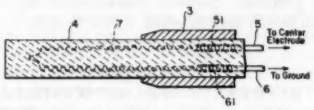
Hideo Kawamura, Kanagawa; Nobukazu Sagawa, and Noriyoshi Yamamoto, both of Kagoshima, all of Japan, assignors to Isuzu Motor, Ltd., Tokyo and Kyoto Ceramic Co., Ltd., Kyoto, both of, Japan

Continuation of Ser. No. 335,422, Dec. 29, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 574,637

Claims priority, application Japan, Dec. 29, 1980, 55-188940[U]

Int. Cl.³ F23Q *7/22*

U.S. Cl. 219—270 **9 Claims**



1. A ceramic glow plug, comprising:

a ceramic heat conducting member;

a metal electrical heat generating element contained within said ceramic heat conducting member, said heat generating element comprising a metal coil having a coil pitch angle which does not exceed 60°, said coil pitch angle being defined as an angle formed between a line parallel to a longitudinal axis of said coil and turns of said coil, said coil forming a substantially U-shaped configuration having a pair of end portions and being embedded in said ceramic heat conducting member;

a pair of leads in said heat conducting member;

said heat generating element being electrically connected by compression heat bonding to front end portions of said leads:

a flexible wire connected to one lead at one end;

a center electrode connected to the other end of said flexible wire;

a sheath coupled to the other lead; and

a protection tube surrounding said heat conducting member;

whereby after said coil is inserted into said heat conducting member, said heat conducting member, said leads and said coil are hot-pressed and subjected to compressive force to form said ceramic glow plug with said leads electrically coupled to said end portions.

4,525,623

HAIR-DRIER WITH VALVES FOR CONTROLLING THE AIR FLOW

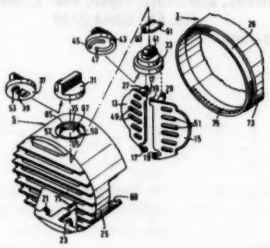
Artur F. Da Silva, Sao Paulo, Brazil, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 513,900

Claims priority, application Brazil, Jul. 19, 1982, 6200942

Int. Cl.³ A45D *20/26;* **F24H** *3/00;* **H05B** *1/00*

U.S. Cl. 219—373 **6 Claims**



1. A hair-drier which comprises a tubular housing having an air outlet; two valve members pivotally mounted in the housing for controlling the flow of air therethrough; an opening formed in the wall of the housing; a rotatable member extending through said opening for actuating said valve members; two curved slots formed in said actuating member; and a projection on each valve member for respective engagement with said curved slots whereby, upon turning of the actuating member, said valve members are pivoted in opposite directions.

4,525,624

DATA LOGGING DEVICE

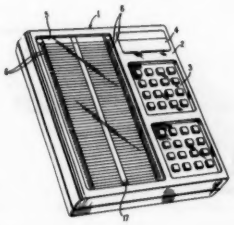
Ronald M. Pontefract, York, England, assignor to Rowntree Mackintosh plc, York, England

Filed Sep. 13, 1982, Ser. No. 417,502

Claims priority, application United Kingdom, Sep. 15, 1981, 8127857

Int. Cl.³ G06K *15/00*

U.S. Cl. 235—383 **12 Claims**



1. A portable data logging device, comprising data storage means; means to display a list from which items are to be selected and which can be replaced by another list external to the device from a portfolio of lists of given format without reference to any program of said device; means coupled to said storage means and operable to select and indicate item positions of said displayed list and to address a storage location of said storage means, allocated to said selected item position, which location stores an identifying code for said item position; and a keyboard coupled to said storage means and operable by an operator to enter into said storage means data relating

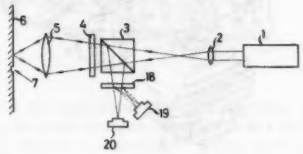
to said indicated item position; wherein said means to select and indicate item positions is operable under the control of said operator to select said item positions sequentially or randomly without reprogramming said device; and wherein there is provided means operable by said operator to enter into said storage means an identity code for the particular list displayed.

4,525,625

FOCUSSING CONTROL WITH ASTIGMATIC DIFFRACTING MEANS

Michiharu Abe, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,400
Claims priority, application Japan, Jun. 7, 1980, 55-76945
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **6 Claims**



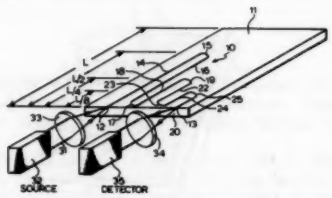
1. A focusing control method for an optical device, comprising the steps of:
   (a) converging a light beam from a light source;
   (b) illuminating a reflective surface with said light beam to produce a reflected beam;
   (c) producing an astigmatic light flux of said reflective beam by a diffraction means;
   (d) detecting the magnitude of said light flux by means of a four sided light sensitive device; and
   (e) focussing said optical device in response to said detection.

4,525,626

FIBER OPTIC VIBRATION MODAL SENSOR

Stephen T. Kush, Austin, Tex., and Marc E. Meffe, Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 24, 1982, Ser. No. 361,274
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **18 Claims**



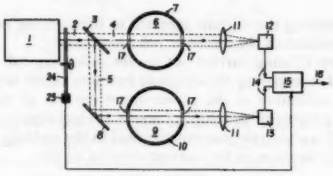
1. An apparatus for monitoring vibration modes of a structure having first and second ends comprising:
   an optical fiber positioned along a serpentine path on said structure, having an input end face adjacent said first end of said structure and an output end face, said serpentine path having turning points located at predetermined distances selected from a sequence of distances defined by L/n, where L equals the length of said structure n=1, 2, 3, . . . from said first end, and arranged to position said input and output end faces of said optical fiber adjacent said first end, and
   means for launching at least two propagating optical modes in said optical fiber such that a temporal intensity modulated signal responsive to said vibration modes appears at said output end face; and
   means coupled to receive said temporal intensity modulated signal from said output end face for detecting intensity modulation thereof and providing output signals representative of said intensity modulation.

4,525,627

METHOD AND DEVICE FOR CONTINUOUS MEASUREMENT OF THE MASS OF AEROSOL PARTICLES IN GASEOUS SAMPLES

Peter W. Krempl, and Wolfgang Schindler, both of Graz, Austria, assignors to A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H., Graz, Austria

Filed May 4, 1983, Ser. No. 491,553
Claims priority, application Austria, May 6, 1982, 1788/82
Int. Cl.³ G01J *3/42;* **G01N** *21/21, 21/59*
U.S. Cl. 250—345 **8 Claims**



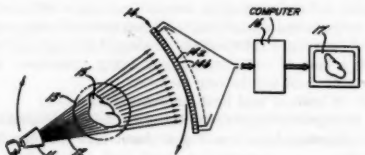
1. A method for the continuous measurement of the mass of aerosol particles in a gaseous sample, preferably in the exhaust of an internal combustion engine, the sample being traversed by electromagnetic radiation in the optical Rayleigh range and the absorption caused being measured and utilized as a measurement value, wherein electromagnetic radiation of a wavelength in the range between 3.8 and 4.15 μm is used, said radiation traversing a reference volume in addition to a test volume containing said sample, and the difference in the radiation intensities after passage of said two volumes is used as a measurement value proportional to the specific mass of—mainly graphitic—particles characterized by broadband absorption which are contained in said sample.

4,525,628

RARE EARTH CERAMIC SCINTILLATOR

Frank A. DiBianca, Chapel Hill, N.C.; Jean-Pierre J. Georges, Waukesha, Wis.; Dominic A. Cusano, and Charles D. Greskovich, both of Schenectady, N.Y., assignors to General Electric Company, Waukesha, Wis.

Filed Jun. 18, 1982, Ser. No. 389,828
Int. Cl.³ G01T *1/202;* **C09K** *11/46*
U.S. Cl. 250—367 **8 Claims**



1. In a radiation detector for use with a source of penetrating radiation, a detector array having a plurality of channels for receiving the radiation, the channels each including a scintillator and a photo-responsive means coupled thereto for producing a set of signals related to the radiation detected in the

respective channels, the improvement wherein each scintillator comprises a polycrystalline ceramic scintillator crystal for detecting the radiation in the channels, the crystals being formed of a rare earth oxide doped with a rare earth activator to form a cubic crystal structure which scintillates at a predetermined wavelength, the crystal having a porosity no greater than about 0.1% and being substantially optically transparent to efficiently couple the scintillated radiation to the photoresponsive means.

4,525,629

DEFLECTIVE FOCUSING SYSTEM FOR CHARGED PARTICLE BEAM

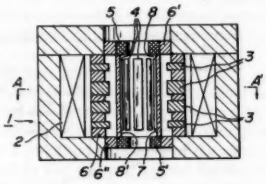
Hirofumi Morita, Kiyose, and Teruo Hosokawa, Tokorozawa, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,115

Claims priority, application Japan, Jun. 15, 1981, 56-90901

Int. Cl.³ G21K *1/08*; H01J *3/14*

U.S. Cl. 250—396 ML **16 Claims**



1. A deflective focusing system for a charged particle beam comprising:

a magnetic lens for focusing a charged particle beam;

a plurality of rings made of magnetic material arranged substantially concentric with said magnetic lens inside of said magnetic lens, said rings being arranged dividedly in the direction of the central axis of said magnetic lens so as to form a predetermined magnetic focusing field distribution; and

a one-stage electrostatic deflector having a plurality of deflection electrodes which are divided in a circumferential direction of said magnetic lens, are arranged substatially concentric with said magnetic lens inside of said magnetic lens and are extended in the direction of said central axis so as to form a predetermined electrostatic deflection field distribution, the charged particle beam passing through said concentrically arranged deflection electrodes to be deflected in accordance with a voltage applied to said deflection electrodes.

4,525,630

APPARATUS FOR DETECTING TAPE ON SHEETS

Christopher P. Chapman, Hayling Island, England, assignor to De La Rue Systems Limited, Portsmouth, England

Filed Aug. 11, 1982, Ser. No. 407,209

Claims priority, application United Kingdom, Aug. 11, 1981, 8124512

Int. Cl.³ G01H *21/88*

U.S. Cl. 250—572 **5 Claims**

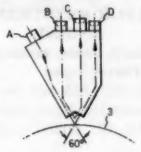
1. Apparatus for sensing the condition of the surface of a moving printed document, comprising:

(a) illuminating means (A) including a plurality of optical fibres for guiding light to the surface of the document, said fibres having laterally spaced light-emitting ends with a low numerical aperture to direct collimated beams of light at a plurality of adjacent regions in a line across the document in a direction transverse to its movement;

(b) a pair of first and second light receivers for each illuminated region of the document, each pair including individual first and second photoelectric means and associated optical fibres leading to the individual photoelectric means;

(c) light-receiving ends of the optical fibers of the first light receivers (D) being laterally spaced across the path of document movement for receiving light specularly reflected from the plurality of adjacent illuminated regions, and the associated first photoelectric means providing corresponding first electrical signals;

(d) light-receiving ends of the optical fibers of the second light receivers (B) being laterally spaced across the path of document movement for receiving light diffusely reflected from corresponding ones of said regions, and the associated second photoelectric means providing corresponding second electrical signals; and



(e) signal-analyzing means (**10–14**) for receiving the signals from each pair of first and second light receivers and responsive, for each pair, to an increase in the ratio of the instantaneous values of the first and second signals, representing respectively light reflected specularly and diffusely from the corresponding illuminated region, to provide a signal output indicative of the presence of shiny tape on the illuminated surface of the document.

4,525,631

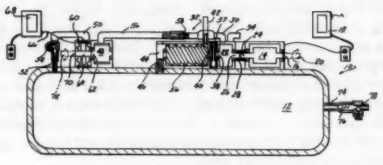
PRESSURE ENERGY STORAGE DEVICE

John H. Allison, 43040 Penny, Sterling Heights, Mich. 48078

Continuation-in-part of Ser. No. 335,983, Dec. 30, 1981, Pat. No. 4,447,738. This application Jan. 10, 1984, Ser. No. 569,722

Int. Cl.³ F01C *13/00*

U.S. Cl. 290—4 R **25 Claims**



1. A pressure energy storage device comprising:

a storage reservoir for storing pressurized fluid;

compressor means having compressor intake means, compressor exhaust means, and an input shaft, said compressor intake means being interconnected with a source of fluid, said compressor exhaust means being interconnected with said storage reservoir for fluid flow therebetween, said compressor means being selectively operable in response to rotary motion of said input shaft to draw fluid from said source of fluid, pressurize said fluid, and deliver said pressurized fluid to said storage reservoir;

primary fluid motor means having primary fluid motor intake means, primary fluid motor exhaust means, and an output shaft, said primary fluid motor intake means being interconnected with said storage reservoir for fluid flow therebetween, said output shaft being rotatably driven by pressurized fluid flowing through said primary fluid motor means from said primary fluid motor intake means to said primary fluid motor exhaust means;

control means selectively operable to permit said pressurized fluid in said storage reservoir to flow through said primary fluid motor means to generate rotary motion of said output shaft; and

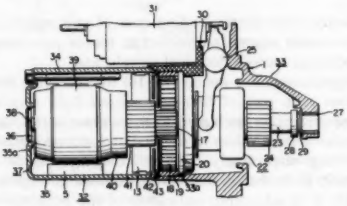
secondary fluid motor means interconnected with said input shaft such that said compressor means is selectively driven by said secondary fluid motor means, said secondary fluid motor means having secondary fluid motor intake means interconnected with a source of pressurized fluid and a secondary fluid motor exhaust means interconnected with a low pressure sink means.

4,525,632

STARTER MOTOR FOR AN INTERNAL COMBUSTION ENGINE

Toshinori Tanaka, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,981
Claims priority, application Japan, Feb. 2, 1982, 57-13900[U]
Int. Cl.³ F02N *11/00*
U.S. Cl. 290—38 R **7 Claims**



1. In a reduction gear type starter motor having a yoke and poles for an internal combustion engine having a rear, an intermediate and a front bracket, the motor being interposed between said rear and intermediate brackets, said intermediate bracket containing gear trains in mesh with the rotary shaft of said motor, said front bracket containing an overrunning clutch mounted to the output rotary shaft of said gear trains and a shift lever to actuate said overrunning clutch, a pinion secured to said overrunning clutch being adapted to be meshed with a gear of said internal combustion engine, the improvement comprising only one faucet joint, said front bracket and said intermediate bracket together integrally forming a first integral part containing said overrunning clutch, said shift lever and said pinion, and said rear bracket and said yoke of said motor together integrally forming a second integral part with said poles secured to the inner periphery thereof, said second integral part and said first integral part being connected together by said faucet joint.

4,525,633

WIND TURBINE MAXIMUM POWER TRACKING DEVICE

Max M. Wertheim, and Richard J. Herbermann, both of Huntington, N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

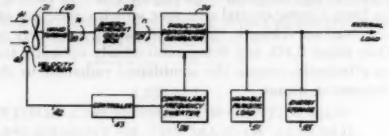
Filed Sep. 28, 1982, Ser. No. 425,760
Int. Cl.³ F03D *9/02*; H02P *9/14*
U.S. Cl. 290—44 **18 Claims**

1. In a stand-alone wind power generating system having a wind turbine driving a generator connected to an external load and an energy storage device, the improvement comprising a maximum power tracking device comprising:

means for measuring changes in the velocity of wind incident upon the turbine,

means for applying an excitation frequency to the generator, said generator being an induction generator, and

means for varying said excitation frequency in response to said wind velocity changes so that the shaft speed of the induction generator, and thereby of the wind turbine are adjusted to maintain a pre-determined ratio between said



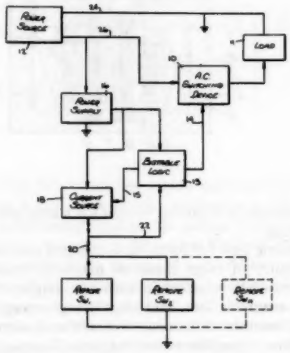
wind velocity incident upon the turbine and said turbine shaft speed.

4,525,634

ALTERNATING CURRENT SWITCHING DEVICE

James S. Southard, P.O. Box 46, Union, Mich. 49130

Filed May 10, 1983, Ser. No. 493,225
Int. Cl.³ H01H *47/00*
U.S. Cl. 307—115 **13 Claims**



1. A switching device providing independent control of the connection of a load to a source of electric power from any one of a plurality of locations which are disposed along a control circuit while at the same time providing an indication at each of the locations of the state of the load connection, the switching device comprising:

load switch means for connecting the load to the source of electric power, the load switch means having an input for a load control signal, the load switch means being responsive to successive load control signals to connect and to disconnect the load and the source of electric power;

control switch means adapted to be connected to the control circuit at each different location of the plurality of locations, each control switch means being adapted to normally present a first impedance to the control circuit and when actuated to momentarily present a second impedance to the control circuit;

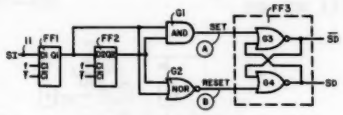
means adapted to be connected to the load switch means and to the control circuit for generating a load control signal for the input of the load switch means and for generating an indicator signal for the control circuit, the signal generating means being adapted to generate the load control signal and the corresponding indicator signal in response to the presence of the second impedance on the control circuit; and

indicator means adapted to be disposed at each different location of the plurality of locations, each indicator means being adapted to be connected to the control circuit and to respond to an indicator signal thereon to indicate the state of the load connection.

4,525,635
TRANSIENT SIGNAL SUPPRESSION CIRCUIT

James E. Gillberg, Flemington, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 15, 1982, Ser. No. 450,062
Int. Cl.³ H03K 17/56, 19/00
U.S. Cl. 307—247 R 9 Claims

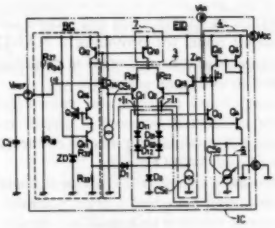


1. The combination comprising:
an input terminal adapted to receive an input signal;
means comprising first and second flip-flops coupled to said input terminal for storing in said second flip-flop a signal (SI_1) corresponding to the value of said input signal at a time t_1, and for storing in said first flip-flop a signal (SI_2) corresponding to the value of said input signal at a time t_2, where t_2 is subsequent to t_1 and the interval t_1 to t_2 defines a sampling interval;
a set/reset flip flop; and
means, coupled between said first and second flip-flops and said set/reset flip-flop, responsive to the signals stored in said first and second flip flops for: (a) placing said set/reset flip-flop in a condition indicative of the value of the input signal stored in said first and second flip-flops when SI_1 is equal to SI_2; and (b) maintaining said set/reset flip-flop in the condition it had prior to t_1 when SI_1 is not equal to SI_2.

4,525,636
VARIABLE ELECTRONIC IMPEDANCE CIRCUIT

Yasuo Kominami; Yuichi Ohkubo, both of Takasaki; Kohki Aizawa, Sagamihara, and Satoshi Sasaki, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Pioneer Electronic Corp., both of Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,147
Claims priority, application Japan, Aug. 28, 1981, 56-134007
Int. Cl.³ H03K 3/023, 17/16
U.S. Cl. 307—264 13 Claims

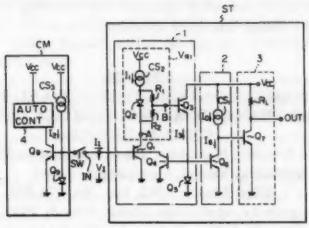


1. A variable electronic impedance circuit comprising:
a power supply terminal to which a power supply voltage is to be coupled for supplying an operational voltage to said circuit;
a voltage-current converter having a first input terminal coupled to receive an input signal voltage;
a variable-gain current amplifier having an input terminal coupled to receive an output current produced by said voltage-current converter and generating an output signal current which is coupled to said first input terminal of said voltage-current converter; and
means, coupled to said power supply terminal and said voltage-current converter, for preventing the operation of said voltage-current converter for a predetermined period of time subsequent to the application of said power supply voltage to said power supply terminal.

4,525,637
INTEGRATED CIRCUIT HAVING AN INPUT VOLTAGE-CLAMPING FUNCTION AND AN INPUT CURRENT-DETECTING FUNCTION

Yoshiaki Sano, Kawasaki; Chikara Tsuchiya, and Osamu Maida, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki and Nippon Kogaku K.K., Tokyo, both of, Japan

Filed Sep. 28, 1982, Ser. No. 425,654
Claims priority, application Japan, Sep. 29, 1981, 56-152871
Int. Cl.³ H03K 5/08, 5/153
U.S. Cl. 307—350 12 Claims

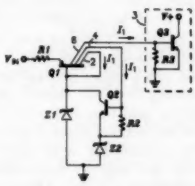


1. An integrated circuit having an input voltage-clamping function and an input current-detecting function, comprising:
a single input terminal for receiving an input signal having a voltage and an input current;
an output terminal;
a voltage-clamping circuit, operatively connected to said single input terminal, for clamping the voltage at said single input terminal while the input current supplied to said single input terminal is greater than a first predetermined value;
a current-detecting circuit, operatively connected to said voltage-clamping circuit, for detecting whether the input current supplied to said input terminal is greater than a second predetermined value and for generating a detection signal when the input current is greater than the second predetermined value; and
an output circuit, operatively connected between said current-detecting circuit and said output terminal, for providing an output signal at said output terminal in response to said detection signal.

4,525,638
ZENER REFERENCED THRESHOLD DETECTOR WITH HYSTERESIS

Randall C. Gray, Scottsdale, Ariz., assignor to Motorola, Inc. Schaumburg, Ill.

Filed Jan. 16, 1984, Ser. No. 571,232
Int. Cl.³ H03K 5/153
U.S. Cl. 307—350 9 Claims



1. A voltage threshold detector of the type wherein a

switching transistor turns on when an input voltage exceeds a predetermined threshold voltage, comprising:

switching transistor means having base, emitter and first, second and third collector terminals, said first collector terminal coupled to said base;

first impedance means coupled between said emitter terminal of said switching transistor and said input voltage;

first diode means having an anode coupled to a first source of supply voltage and a cathode coupled to the base terminal of said switching transistor, said first diode means for establishing, in conjunction with the base-emitter voltage of said switching transistor, the value of said input voltage necessary to turn on said switching transistor; and

first means coupled to said second collector terminal for reducing the voltage at the base terminal of said switching transistor after said switching transistor has turned on, said third collector terminal representing the output of said voltage threshold detector.

4,525,639

DYNAMIC MOS CIRCUIT BLOCK AND STATIC BIPOLAR TRANSISTOR CIRCUIT BLOCK INTEGRATED CIRCUIT DEVICE

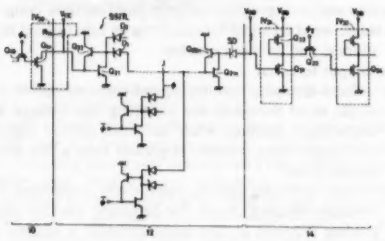
Terumoto Nonaka, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 4, 1982, Ser. No. 374,893

Claims priority, application Japan, May 9, 1981, 56-69784

Int. Cl.³ H03K *19/092, 19/096;* **G11C** *19/28*

U.S. Cl. 307—446 **16 Claims**



1. A digital semiconductor integrated circuit device, for receiving input and outputting output electrical signals, having a common semiconductor substrate and comprising:

at least one dynamic MOS shift register circuit block means for processing digital signals and having a signal input terminal for receiving said input electrical signals, a signal output terminal and a first clock input terminal and being formed in said common substrate;

at least one static induction transistor circuit block means for processing signals and having a signal input terminal, a signal output terminal for outputting said output electrical signals and a second clock input terminal and being formed in said common substrate, said static induction transistor circuit block means comprising a normally-off static induction transistor being operated in a bipolar mode;

said signal output terminal of said at least one dynamic MOS shift register circuit block means being connected to said signal input terminal of said at least one static induction transistor circuit block means; and

first and second clock signal generating means for, respectively, generating first and second clock signals respectively applied to said first and second clock input terminals, said first and second clock signals having a predetermined timing relationship with each other so that said dynamic MOS shift register circuit block means and said static induction transistor circuit block means are operated in relation with each other according to said predetermined timing relationship.

4,525,640

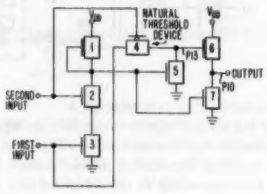
HIGH PERFORMANCE AND GATE HAVING AN "NATURAL" OR ZERO THRESHOLD TRANSISTOR FOR PROVIDING A FASTER RISE TIME FOR THE OUTPUT

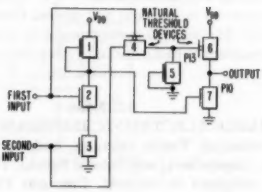
David H. Boyle, and Daniel J. Kouba, both of Manassas, Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,033

Int. Cl.³ H03K *19/017, 19/094, 17/04, 17/693*

U.S. Cl. 307—450 **3 Claims**





1. An AND gate driver circuit comprising:

a NAND block having a first and second input terminals and an output node, for providing a NAND logic function voltage at said output thereof in response to the voltages applied to said input terminals;

an output circuit including an enhancement mode FET device connected between a circuit output node and ground potential, having its gate connected to said output node of said NAND block;

a low threshold voltage FET device connected between said circuit output node and a drain potential, having its gate connected through an impedance means to said ground potential;

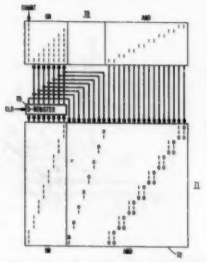
a substantially zero threshold voltage FET device having its source/drain path connected between said gate of said low threshold voltage FET device and a first one of said circuit inputs, and having its gate connected to a second one of said circuit inputs; said zero threshold device conducting current between said first one of said circuit inputs and said gate of said low threshold FET device when the potential of said first input begins to rise, and said zero threshold device impeding current flow between said gate of said low threshold FET device and said first one of said circuit inputs when the voltage at said circuit output node rises;

whereby the rise time of the voltage at said circuit output node is reduced.

4,525,641
FLIP-FLOP PROGRAMMER USING CASCADED LOGIC ARRAYS

Claude A. Cruz, Fremont, Calif., and Johannes C. Vermeulen, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,652
Int. Cl.³ H03K 19/173, 3/027
U.S. Cl. 307—465 3 Claims



1. A circuit for implementing any given flip-flop circuit comprising, in combination:

flip-flop means of at least one type having input means and output means;

first and second logic array means having input means and output means for supplying as signals at their output means selective logic derivations of signals applied to their input means;

means for coupling said output means of said second array means to the input means of said flip-flop means;

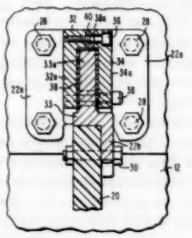
means for coupling said output means of said flip-flop means to said input means of the first and second logic array means; and

means for coupling said output means of said first logic array means to the input means of said second logic array means.

4,525,642
TURBINE GENERATOR WITH STATOR END WINDING SUPPORT ASSEMBLY INCLUDING RESILIENT BRACKET

Benjamin T. Humphries, Orlando, Fla., and Andrew J. Spisak, Bethel Park, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1984, Ser. No. 596,880
Int. Cl.³ H02K 3/46
U.S. Cl. 310—260 7 Claims



1. A dynamoelectric machine comprising:

a stator with a core and a stator winding, said core having a generally cylindrical bore;

a rotor shaft mounted for rotation within said bore of said stator;

said stator winding including portions within slots in said core and end winding portions extending in the axial direction from each end face of said core;

a support assembly for said end winding portions comprising means for restraining said end winding portions against excessive motion in radial and axial directions, said means for restraining comprising a brace and a bracket located radially outside each of a plurality of said end winding portions;

said brace comprising a member extending radially outside said end winding portion and supported to bear against said end winding portion;

said bracket having a core mounting fixedly secured to said core and a brace mounting fixedly secured to said brace, said bracket also having one or more resilient elements for allowing relative movement between said core mounting and said brace mounting in the axial direction;

said bracket core mounting comprising a first member with a flange fitting substantially flush against said core and a plate, rigidly united with said flange, extending axially from said flange;

said bracket brace mounting comprising a second member with a flange fitting substantially flush against a surface of said brace and a plate, rigidly united with said flange, having a surface extending parallel with a surface of said first member plate;

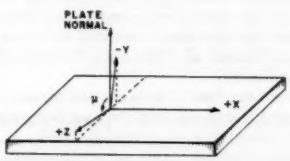
at least one of said resilient elements being a sheet of elastomeric material disposed between said parallel surfaces of said first and second members' plates and flexing in shear and compression modes in operation; and

means for securing said first and second members' plates together is provided while relative axial motion therebetween is provided for by said resilient element.

4,525,643
TEMPERATURE COMPENSATED ORIENTATIONS OF BERLINITE FOR SURFACE ACOUSTIC WAVE DEVICES

Bruce H. Chai, Bridgewater, N.J.; Dana S. Bailey, Columbia, Md.; John F. Vetelino, Veazie, Me.; Donald L. Lee, Orono, Me., and Jeffrey C. Andle, Bangor, Me., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 28, 1983, Ser. No. 546,677
Int. Cl.³ H01L 41/08
U.S. Cl. 310—313 A 3 Claims



1. A berlinite single crystal having a substantially planar surface defined by the Euler angles λ=about 0°; μ=about 94°–104°; and θ=about 0°.

4,525,644
PIEZOELECTRIC-ENHANCED CIRCUIT CONNECTION MEANS

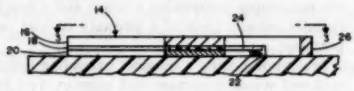
Sigurd Frohlich, 4141 Mariposa, Santa Barbara, Calif. 93110

Filed Apr. 9, 1984, Ser. No. 597,916
Int. Cl.³ H01L 41/08
U.S. Cl. 310—328 5 Claims

1. In a circuit device of the type having electrical circuit paths at least some of which terminate in connector pads for connecting the circuit device to other circuit devices by means of at least one electrical connector, the improvement comprising:

an electrostrictive material intimately associated with each

of said connector pads and being adapted for selective connection to a source of electrical voltage for selectively increasing the geometrical dimensions of said electrostric-



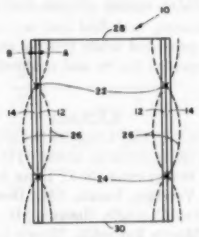
tive material for increasing the mechanical engagement between said connector pads and said electrical connector.

4,525,645

CYLINDRICAL BENDER-TYPE VIBRATION TRANSDUCER

Donald J. Shirley, Boerne, and Thomas E. Owen, Helotes, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 11, 1983, Ser. No. 540,288
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—337 **15 Claims**



1. An electromechanical transducer comprising:

a hollow cylinder with walls formed of a first and a second layer, at least one of said first or second layers being a piezoelectric material polarized in a thickness dimension to cause said piezoelectric material to extend or contract in a longitudinal direction upon electrical signals being applied thereto;

metal electrodes bonded to inside and outside faces of said piezoelectric material, said first layer being rigidly bonded to said second layer by a bonding agent;

means for connecting to said metal electrodes to receive or transmit said electrical signals, when said metal electrodes receive said electrical signals said piezoelectric material will extend or contract in a longitudinal direction to cause symmetrical vibrations of said hollow cylinder only in a radial direction with respect to a longitudinal axis of said hollow cylinder, and when acoustical signals are received said acoustical signals symmetrically vibrate said hollow cylinder in a radial direction to cause said piezoelectric material to extend or contract in a longitudinal direction so that said piezoelectric material generates said electrical signals as transmitted by said metal electrodes;

said first and second layers being sized to give approximately maximum electrical signals or acoustical signals, nodes and anti-nodes being formed by said symmetrical vibrations; and

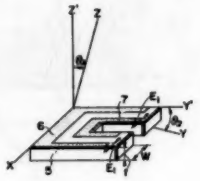
said symmetrical vibrations being caused by said rigid bonding between said first layer and said second layer and differences in said longitudinal extensions or contractions thereof.

4,525,646

FLEXURAL MODE VIBRATOR FORMED OF LITHIUM TANTALATE

Hirofumi Kawashima, Tokyo, Japan, assignor to Seiko Instruments & Electronics, Ltd., Tokyo, Japan

Continuation of Ser. No. 883,256, Mar. 3, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,716
Claims priority, application Japan, Mar. 22, 1977, 52-31423
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—360 **24 Claims**



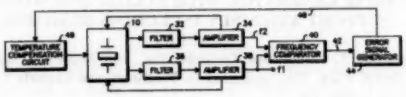
1. A lithium tantalate vibrator for use as a time standard in electronic timepieces comprising: a lithium tantalate crystal having a shape effective to sustain flexural mode vibrations and having an electro-mechanical coupling factor within the range 0.04 to 0.10.

4,525,647

DUAL FREQUENCY, DUAL MODE QUARTZ RESONATOR

Lawrence N. Dworsky, Northbrook, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 557,692, Dec. 2, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,688
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—361 **27 Claims**



1. An AT-cut quartz resonator having two different sets of coupled modes simultaneously occurring that produces two resonant frequencies comprising:

a generally rectangular quartz polyhedron;

first and second electrodes disposed on opposing faces of said polyledron for coupling electrical energy thereto;

the ratio of width to height (W/H) of said polyhedron being within the range of 8 to 25;

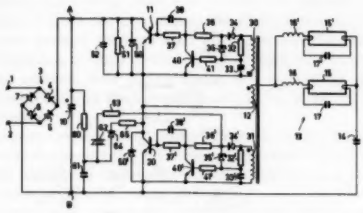
the width (W) dimension of said polyhedron selected such that a first mode set consisting of a thickness shear mode coupled to a first flexure mode and a second mode set consisting of said thickness shear mode coupled to second flexure mode are simultaneously excitable and result in respective first and second signals of different frequencies, the first signal having a substantial magnitude relative to the magnitude of the second signal; and

said polyhedron including means for causing one of the first and second signals to have a substantially cubic frequency versus temperature response over a predetermined temperature range, said means comprising said polyhedron having an AT rotation angle within the range of 34.00–34.50 degrees.

4,525,648
DC/AC CONVERTER WITH VOLTAGE DEPENDENT TIMING CIRCUIT FOR DISCHARGE LAMPS

Adrianus M. J. De Bijl, and Henri A. I. Melai, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,532
Claims priority, application Netherlands, Apr. 20, 1982, 8201631
Int. Cl.³ H05B *41/24*
U.S. Cl. 315—224 **9 Claims**



1. A DC/AC converter for the ignition and the supply of alternating current to an electric discharge lamp comprising: two input terminals for connection to a direct voltage source, means connecting the two input terminals to a first series arrangement which comprises at least a first transistor, a load circuit which—in the operating condition—comprises the lamp, and a capacitor, the load circuit and at least the capacitor being shunted by a second transistor, the load circuit including a circuit element shunting the lamp and a reactive circuit element in series with the lamp, a control device connected in circuit so as to make the two transistors alternately conductive and which includes a timing circuit having a variable time constant in order to ensure that the frequency at which the two transistors are alternately rendered conductive, when the converter is switched on but with the lamp not yet ignited, is different from the frequency of the two transistors in the operating condition of the lamp so that the starting current is limited, and wherein the load circuit includes, in series with the lamp, a primary winding of a transformer, and the timing circuit is connected between two terminals of a secondary winding of the transformer and the time constant of said timing circuit is voltage-dependent.

4,525,649
DRIVE SCHEME FOR A PLURALITY OF FLOURESCENT LAMPS

William C. Knoll, Turbotville, Pa., and David L. Bay, Beverly, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 397,266, Jul. 12, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,667
Int. Cl.³ H05B *39/00*
U.S. Cl. 315—96 **5 Claims**

1. A drive circuit for a plurality of series connected fluorescent lamps, said drive circuit comprising:

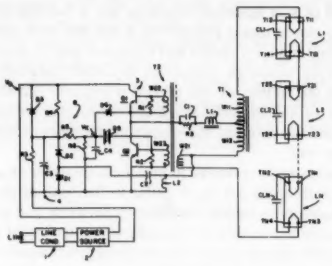
a set of terminals associated with each of said plurality of fluorescent lamps, each set comprising first, second, third and fourth terminals;

a filament connected between each first and second terminal and each third and fourth terminal of each lamp;

an output transformer having first and second ends, said first end being connected to the first terminal of the first lamp of said plurality and said second end being connected to the third terminal of the last lamp of said plurality, said output transformer further being connected, at a point intermediate said first and second ends, to a source of oscillatory drive signals;

a feedback winding connected between said second end of said output transformer and said third terminal of said last lamp for controlling the oscillator;

means connecting the third terminal of said first lamp to the first terminal of said last lamp to form a single wire connecting the lamps in series; and

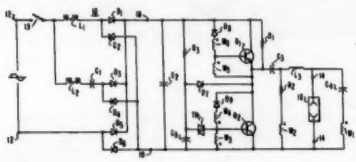


an impedance element connected between said second terminal and said fourth terminal of each of said lamps, wherein the filaments are heated from the transformer through the series impedances and wherein removal of a lamp will automatically stop the oscillator from supplying power.

4,525,650
STARTING AND OPERATING METHOD AND APPARATUS FOR DISCHARGE LAMPS

John M. Hicks, Penn Hills; Joseph C. Engel, Monroeville; Robert J. Spreadbury, Murrysville; Robert T. Elms, Monroeville, and Gary F. Saletta, Irwin, all of Pa., assignors to North American Philips Lighting Corporation, New York, N.Y.

Continuation of Ser. No. 347,274, Feb. 11, 1982, abandoned. This application Jan. 10, 1984, Ser. No. 569,547
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—226 **10 Claims**



1. Apparatus for starting and operating miniature metal-vapor discharge lamp means, said apparatus having input terminals adapted to be connected across a source of AC potential of predetermined magnitude, and said apparatus having output terminals across which said discharge lamp means is adapted to be operatively connected, said apparatus comprising:

AC current-limiting and rectifying means having an input connected to said apparatus input terminals and operable to generate at the output thereof a current-limited low-ripple DC potential;

a lamp means starting circuit comprising series-connected inductor means and capacitor means forming a resonant circuit, said starting circuit capacitor means connected across said apparatus output terminals, a blocking capacitor and a charging impedance connected in series with said starting circuit, and the series combination of said starting circuit, blocking capacitor and charging impedance connected across said output of said AC current-limiting and rectifying means;

a pair of transistors comprising oscillator means electrically connected in series arrangement across said output of said AC current-limiting and rectifying means, and the con-

nection between said transistors being electrically connected to said blocking capacitor means;

air-core transformer means comprising a pair of feedback windings and a pair of driving windings, a first of said feedback windings connecting in series with said starting circuit inductor means and capacitor means, and the second of said feedback windings and a current-controlling impedance means connecting in parallel with said starting circuit inductor means and capacitor means, a first of said driving windings connecting in circuit between the base and the emitter of one of said transistors and the second one of said driving windings connecting in circuit between the base and the emitter of the other of said transistors; and

trigger means responsive to initial energization of said apparatus to apply a turn-on pulse to the base of one of said transistors to initiate oscillations between said transistors to generate square waves; whereby after initial energization of said apparatus and until said lamp means is started said transistors alternately conduct to deliver square waves of current to said lamp means at an oscillation frequency determined by the resonant frequency of said starting circuit series-connected inductor means and capacitor means, and said air-core transformer having a magnetizing inductance such that after said lamp means is started said transistors alternately conduct to deliver square waves of current to said operating lamp at an oscillation frequency determined by the rate of current flow into said second feedback winding.

4,525,651

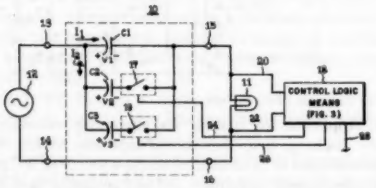
CAPACITIVELY BALLASTED LOW VOLTAGE INCANDESCENT LAMP

Frederic F. Ahlgren, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 379,412, May 18, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 630,997

Int. Cl.³ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—240 **7 Claims**



1. A ballast circuit means controlling power from an alternating current source to an incandescent lamp, having a filament, at a voltage magnitude that is less than the alternating current source voltage comprising:

(a) a first capacitive element electrically serially connected to said lamp which together are across the ballast means input terminals;

(b) at least one auxiliary capacitive element;

(c) a control means connected across the filament of said lamp generating discrete control signals in response to conditions of the current flowing through the filament; and,

(d) switching means responsive to said control signals for selectively and individually electrically connecting each auxiliary capacitive element in parallel across said first capacitive element for one or more complete cycles of the alternating current source waveform.

4,525,652

AUXILIARY-VOLTAGE SOURCE FOR SUPPLYING ELECTRIC CIRCUITS WHICH ARE AT A HIGH POTENTIAL

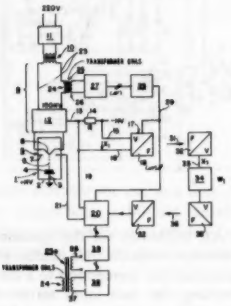
Wolfgang Sperzel, Gelnhausen-Hailer, and Johann Stürmer, Freigericht, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,402

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239337; Aug. 26, 1983, 3330728

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—307 **14 Claims**



1. An auxiliary-voltage DC source for an electric circuit having AC and DC sections, comprising:

a current transformer (**25, 25***a*) which has a primary winding (**24**) in the AC section and at least a first secondary winding (**26**);

a rectifier (**27**) connected across the first secondary winding (**26**) and having an output for the rectified potential therefrom; and

a parallel regulator (**28**) connected to the output of the rectifier (**27**) and having an output for providing the auxiliary-voltage DC source to the electric circuit.

4,525,653

MODULAR DISPLAY APPARATUS WITH MEANS FOR PREVENTING BRIGHTNESS VARIATIONS

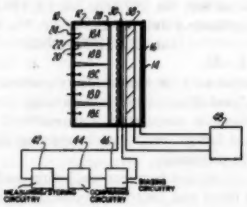
James Smith, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,259

Claims priority, application United Kingdom, Sep. 17, 1982, 8226501

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—366 **14 Claims**



1. A display apparatus for successively producing a series of image frames, said apparatus comprising a flat panel cathode-ray display tube including a luminescent screen, a plurality of electron-emitting means and an apertured control plate disposed between the electron emitting means and the screen,

said display tube comprising a plurality of modules, each

including at least one of the electron-emitting means and a portion of the control plate associated with a respective area of the screen, for producing from distributions of emitted electrons respective areas of the image frames,

the improvement comprising:

(a) a plurality of parallel switching electrodes in each module associated with respective rows of apertures in the control plate for controlling the passage of current through said apertures, said switching electrodes being disposed on a side of the control plate facing the electron-emitting means;

(b) at least one brightness control electrode in each module associated with a respective column of apertures in the control plate for controlling the magnitudes of any currents passing through said apertures, said at least one brightness control electrode being disposed on a side of the control plate facing the screen and being oriented transversely to the switching electrodes in the respective module;

(c) means for sequentially measuring the magnitudes of the currents passing through selected apertures in said rows as the switching electrodes are sequentially activated, between successive image frames;

(d) comparing means for determining the differences between the magnitudes of the measured currents and a reference magnitude; and

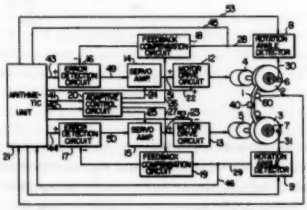
(e) biasing means for applying bias voltages representing the differences to the respective brightness control electrodes associated with the apertures for which the differences were determined, in synchronism with sequential activation of the switching electrodes associated with said apertures, during production of each image frame, to prevent variations in image brightness corresponding to non-uniform electron distributions in the modules.

4,525,654

TAPE TRANSPORT CONTROL UNIT

Fujio Tajima, and Hiromu Hirai, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,796
Claims priority, application Japan, Dec. 9, 1981, 56-196786
Int. Cl.³ H02P *5/46*
U.S. Cl. 318—7 **11 Claims**



1. A tape transport control unit in a magnetic tape apparatus in which a supply reel and a take-up reel are driven by separate motors and a magnetic tape on the supply reel is transported from the supply reel to the take-up reel past a read/write head disposed between the reels without routing a buffer through a substantially constant length path and a reel status amount representing a total amount of the tape on the reels varies from time to time, comprising:

reel status amount sensing means for sensing the reel status amount of tape roll radii and reel moments of each of said supply reel and said take-up reel:

reel drive means for comparing a predetermined target signal of each of said supply reel and said take-up reel with a feedback signal obtained by adjusting a signal from said status amount sensing means by means of a feedback compensation circuit, and for driving reel drive motors separately connected to each reel on the basis of the compared signal;

arithmetic and storage means for calculating and storing gain values and feedback constants of said reel drive means which are compensation constants necessary for equalizing dynamic operations of each reel drive means, in accordance with the reel status amount from each reel status amount sensing means; and

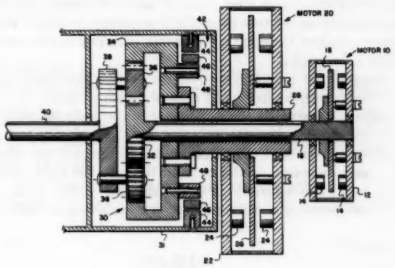
means for selecting a compensation constant corresponding to the instantaneous tape roll radii from said compensation constants calculated by and stored in said arithmetic and storage means in response to said sensing means and for setting the selected compensation constant as a compensation constant for said reel drive means.

4,525,655

TWO STAGE ELECTRIC DRIVE

David E. Walker, 1055 Shawnmarr Rd., #90, Mississauga, Ontario, Canada L5H 3V2

Filed Nov. 23, 1979, Ser. No. 96,800
The portion of the term of this patent subsequent to Apr. 25, 1998, has been disclaimed.
Int. Cl.³ H02K *17/34*
U.S. Cl. 318—45 **8 Claims**



1. An electric motor drive system which comprises;

a first direct current electric motor having a predetermined power rating;

a first drive shaft to which said first electric motor is drivingly coupled;

a second direct current electric motor having a predetermined power rating higher than said first motor;

a second drive shaft to which said second electric motor is drivingly coupled, said second drive shaft comprising a hollow sleeve member with said first drive shaft extending generally axially therethrough;

an epicyclic gear system in turn comprising;

a sun gear to which said first drive shaft is drivingly coupled for rotation in a forward direction;

a ring gear to which said second drive shaft is drivingly coupled for rotation is said forward direction;

a plurality of planetary gears meshing with both said sun gear and said ring gear;

an output drive coupled to said planetary gears for conjoint rotation therewith about said sun gear, and,

one-way freewheel rotation restraining means operatively coupled to said ring gear and restraining rotation of said ring gear in a reverse direction only, said rotation restraining means permitting free rotation in said forward direction whereby said ring gear is free to rotate in said forward direction under the influence of said second motor.

4,525,656

APPARATUS FOR OPERATING PLURAL POLY PHASE A.C. MOTORS HAVING A COMMON LOAD

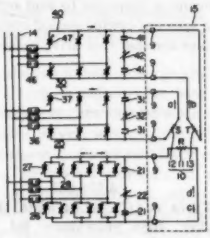
Kunitoshi Kato, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,797

Claims priority, application Japan, Aug. 24, 1982, 57-148080; Sep. 6, 1982, 57-156268

Int. Cl.³ H02P *5/52*

U.S. Cl. 318—85 **6 Claims**



1. An apparatus for operating a plurality of poly phase alternating current motors having a common load, said alternating current motors including a first motor which is a synchronous motor and a second motor which is a synchronous induction motor or synchronous motor, and driving said load in synchronizm through respective connecting means connecting said motors to said load, each of said alternating current motors having respective phase field windings excited variably by direct current supplied by separate exciter circuits, said apparatus comprising:

antiparallel connected thyristor means provided to one of said exciter circuits of said first motor; and

means for sensing the gap between the internal phase angles of said first and second motors and supplying gate control signals to said thyristor means to control the magnitude and direction of the current flow to the field winding of said exciter circuit of only said first motor so as to have the internal phase angles of the motors coincide.

4,525,657

TORQUE RIPPLE COMPENSATION CIRCUIT FOR A BRUSHLESS D.C. MOTOR

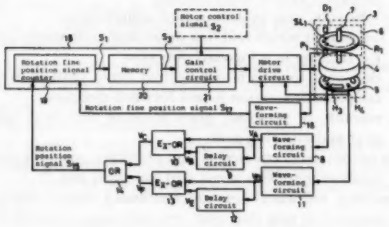
Hiromi Nakase, Nara; Yasuhiro Gotoh, Kadoma, and Kuniichi Ozawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 7, 1984, Ser. No. 587,252

Claims priority, application Japan, Mar. 9, 1983, 58-39882; Nov. 30, 1983, 58-225912; Nov. 30, 1983, 58-225913

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 **4 Claims**



1. Rotation control apparatus for an electronic commutator motor, said electronic commutator motor comprising a predetermined plural number of stator coils disposed with a predetermined mechanical angle around an axis of rotation of said electronic commutator motor, a rotor magnet which has a predetermined number of magnetic poles of N and S disposed alternately with predetermined mechanical angles and held in a rotatable manner around said axis, and a rotation position signal output means for issuing a rotation position signal responding to mechanical rotation of said rotor magnet relative to said stator coils, wherein said rotation control apparatus comprises:

a rotation fine position signal output means for issuing a rotation fine position signal consisting of a predetermined number of pulses during one period of repetition of said rotation position signal in a synchronized relation with the rotation position signal,

a rotation fine position signal counter for producing an electric angle signal which is a signal responding to number of pulses of said rotation fine position signal counted from each time when a pulse of said rotation position signal is issued by receiving said rotation fine position signal,

memory means which has preliminarily stored data of compensation function for compensating amount of stator current to compensate torque ripple, to produce uniform torque, and produces a data responding to said electric angle signal,

gain control means for controlling intensities of said stator coils responding to said output of said memory means, to produce compensated uniform current in said stator coils.

4,525,658

SERVOMOTOR DRIVE SYSTEM

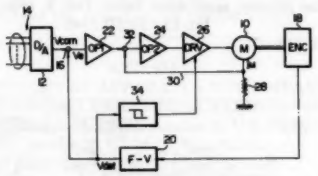
Shoji Yanagida, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Jun. 15, 1984, Ser. No. 620,945

Claims priority, application Japan, Jun. 15, 1983, 58-107287

Int. Cl.³ H02P *5/00*

U.S. Cl. 318—317 **8 Claims**



1. A drive system for a servomotor, comprising

a source of a variable command signal representative of the speed at which the servomotor is to operate,

motor speed detecting means for detecting the output speed of the servomotor and producing a detected speed signal representative of the detected output speed of the servomotor,

first and second voltage sources respectively operative to supply predetermined voltages, the voltage from the first voltage source being higher than the voltage from the second voltage source,

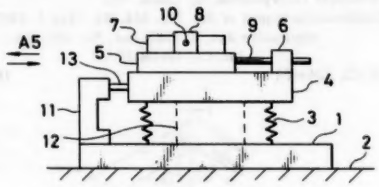
switching means responsive to the detected speed signal from said detecting means and operative to select the first voltage source when the detected speed signal is increased in magnitude to a first threshold level and select the second voltage source when the detected speed signal is decreased in magnitude to a second threshold level lower than the first threshold level, and

drive means responsive to said command signal and operative to provide a path of current from the voltage source selected by said switching means to the servomotor.

4,525,659
POSITIONING STAGE HAVING A VIBRATION SUPPRESSOR

Issei Imahashi, Yamanashi, and Teruo Asakawa, Nirasaki, both of Japan, assignors to Telmec Co., Ltd., Nirasaki, Japan

Filed Sep. 30, 1982, Ser. No. 429,278
Claims priority, application Japan, Oct. 20, 1981, 56-168206
Int. Cl.³ B64C 17/06
U.S. Cl. 318—649 1 Claim



1. A precision positioning device having a vibration suppressor comprising:

a foundation;

a machine base;

a means for resiliently supporting said machine base on said foundation;

a first positioning stage and a second positioning stage disposed on said machine base, said first and second positioning stages being mounted for movement in first and second predetermined directions, respectively, relative to said machine base;

a first electromechanical driving device and a second electromechanical driving device disposed on said machine base, said first and second electromechanical driving devices being adapted for driving said first and second stages in said first and second predetermined directions, respectively, said first and second driving devices thereby creating undesirable reaction forces on said base relative to said first and second predetermined directions, respectively; and

a first force generator and a second force generator establishing an electromagnetic coupling between said foundation and said base, said first and second force generators each comprising:

(i) a means for generating an electromagnetic field associated with one of said foundation and said base; and

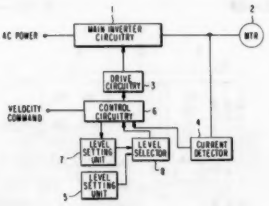
(ii) a conductive coil disposed within the electromagnetic field established by said means for generating, said coil being associated with the other of said foundation and said base; whereby, a first control current and a second control current applied to the coils of said first and second force generators, respectively, provide resistive forces which are substantially equal to and in opposite directions to said undesirable reaction forces thus suppressing vibration of said precision positioning device created by said first and second electomagnetic driving devices, said first and second control currents being proportional to the driving currents applied to said first and second electromagnetic driving devices, respectively.

4,525,660
CONTROL APPARATUS FOR INVERTER

Masayuki Katto, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 580,048
Claims priority, application Japan, Feb. 17, 1983, 58-27136
Int. Cl.³ H02P 5/40
U.S. Cl. 318—798 7 Claims

1. In a control apparatus for an inverter wherein an A.C. power source is subjected to variable-frequency and variable-voltage conversion to drive an induction motor at a variable-speed; an inverter control apparatus comprising: a first current level setting unit (5) for establishing a predetermined current level within a permissible limit of switching elements disposed in the inverter, a second current level setting unit (7) for establishing a current level at a slip value corresponding to a stall torque, in association with a characteristic of the loaded induction motor and an output voltage/output frequency ratio, a current level selector (8) for selecting the smallest one of the

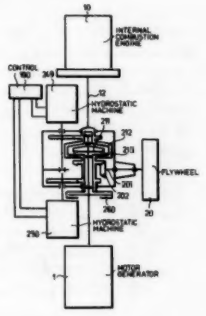


output signals of said first and second current level setting units, a current detector (4) for detecting the inverter output current, and control means (6) for controlling the switching elements in response to a velocity command, the output of the selected current level setting unit, and the detected inverter output current to render the inverter output current smaller than the selected current level signal.

4,525,661
STAND-BY ELECTRICAL SUPPLY SOURCE

Endre Mucsy, Erzsébet k.u.2/c., H-1146 Budapest, and Kázmér Hoós, Ráth Gy. u. 22., H-1122 Budapest, both of Hungary

PCT No. PCT/HU81/00036, § 371 Date Apr. 22, 1982, § 102(e) Date Apr. 22, 1982, PCT Pub. No. WO82/00927, PCT Pub. Date Mar. 18, 1982
PCT Filed Sep. 2, 1981, Ser. No. 375,123
Claims priority, application Hungary, Sep. 2, 1980, 2159/80
Int. Cl.³ H02K 7/02, 7/18
U.S. Cl. 322—4 7 Claims

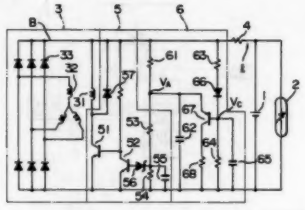


1. A stand-by electrical energy source for equipment to be operated with substantially continuous current supply, comprising three components one of which is at least one electric rotary machine, another of which is a flywheel and the third of which is an auxiliary energy source, planetary gearing comprising a central shaft on which is mounted a sun gear, a planet gear and a ring gear, each of said components being connected with a respective one of said gears, two of said components being interconnected by means of a drive with as infinitely variable transmission.

4,525,662
BATTERY CHARGING CONTROL SYSTEM FOR AUTOMOBILE

Hidetoshi Kato, Anjo; Takeshi Sada; Nobuo Mayumi, both of Oobu, and Hajime Matsuhashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 22, 1983, Ser. No. 554,390
Claims priority, application Japan, Nov. 26, 1982, 57-207897
Int. Cl.³ H02J *7/14;* **H02P** *9/30*
U.S. Cl. 322—28 **8 Claims**



1. A charging control system for an AC generator of an automobile for charging a battery, comprising:

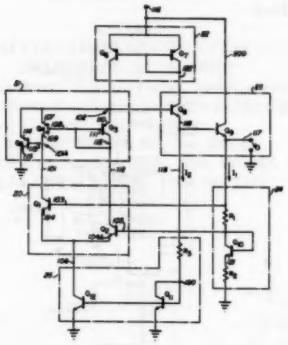
means for detecting minimum value of the charging voltage when the generator charging voltage decreases and for detecting average value of the charging voltage when the generator charging voltage increases; and

means for regulating excitation input of said generator in accordance with the detected values in order to compensate for the changes of said charging voltage.

4,525,663
PRECISION BAND-GAP VOLTAGE REFERENCE CIRCUIT

Paul M. Henry, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Aug. 3, 1982, Ser. No. 404,821
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—280 **36 Claims**



1. A band-gap voltage reference circuit comprising, in combination:

band-gap circuit means;

buffer means coupled to and responsive to said band-gap circuit means for producing a precise output voltage;

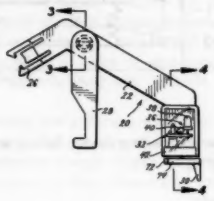
constant current supply means connected to said band-gap means and to said buffer means for causing said buffer means to produce said precise output voltage substantially independent of temperature, load and power supply variations; and

feedback circuit means independent of said constant current supply means coupled to said band-gap circuit means and said buffer means for differentially applying to said band-gap circuit means a portion of said output voltage.

4,525,664
ELECTRONIC FUSE TESTER

Earl M. Trammell, Jr., St. Louis, Mo., assignor to Bek-Tech Products Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 354,381, May 3, 1982,. This application Jan. 3, 1983, Ser. No. 455,193
Int. Cl.³ G01R *19/14*
U.S. Cl. 324—51 **18 Claims**

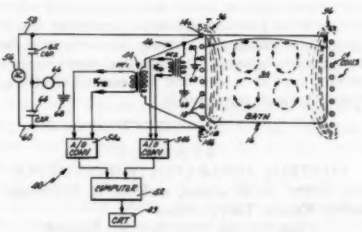


10. A hand held device for testing a fuse as said fuse is mounted between a pair of fuse clips or the like, said device comprising a handle member to facilitate grasping of the device during its use, the handle having a housing member at one end and a fuse puller at its other end, a test circuit, a PC board, said test circuit being mounted to said PC board, two contact members, means to mount said PC board in said housing, means to pivotally mount said contact members in said housing, said PC board mounting means having means to urge said contact members into contact with the PC board and thereby bring them in circuit with the test circuit to thereby enable its energization while mounted therein, said test circuit having illumination means which illuminates in response to a voltage differential sensed between said contact members to thereby indicate a blown fuse.

4,525,665
INDUCTION FURNACE MONITOR

Daniel S. Smalley, 15640 Colfax Cove, Big Rapids, Mich. 49307

Filed Aug. 6, 1982, Ser. No. 405,754
Int. Cl.³ G01R *31/02, 31/08*
U.S. Cl. 324—52 **24 Claims**



1. A device for detecting and determining the position of a ground fault between first and second positions on a coil-shaped conductor, said first position having a higher voltage potential than said second position, said device comprising:

means for measuring a first voltage between the first position and the second position;

means for measuring a second voltage between the first position and a ground fault; and

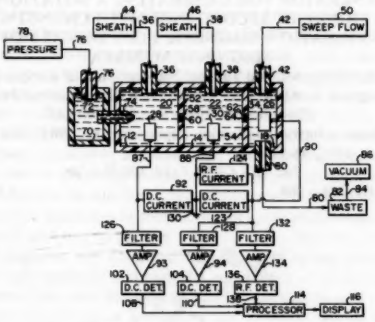
calculator means for determining the ratio of said second voltage to said first voltage, said calculator means including means for determining the coil turn of the conductor and the radial position thereon at which the ground fault is located based on the voltage ratio.

4,525,666

CELL BREAKDOWN

Michael R. Groves, Flemington, N.J., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed May 3, 1982, Ser. No. 374,222
Int. Cl.³ G01N *27/07*
U.S. Cl. 324—71.1 **7 Claims**



1. A particle analyzing apparatus for studying a stream of membrane-sheathed particles in liquid suspension, wherein the particles individually undergo electrical breakdown in an electrical field having at least a minimum electrical breakdown field intensity, said particle analyzing apparatus comprising:

at least two sensing aperture means, including a first sensing aperture means and a second sensing aperture means;

means for moving the liquid suspension of the particles sequentially through all of said sensing aperture means;

first field generating means, for providing a low frequency first electrical field in said first sensing aperture means, having an electrical field intensity less than said minimum electrical breakdown field intensity;

first detecting means responsive to electrical impedance variation for generating a first particle pulse signal with the passage of a given particle through said first sensing aperture means;

second field generating means, for providing a low frequency second electrical field in said second sensing aperture means, having an electrical field intensity which is at least as great as said electrical breakdown field minimum intensity;

second detecting means responsive to electrical impedance variations for generating a second particle pulse signal with the passage of the given particle through said second sensing aperture means; and

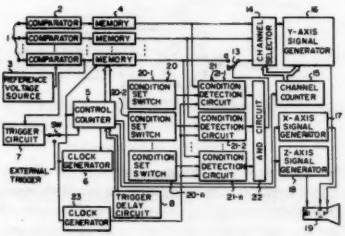
means for correlating said first and second particle pulse signals for the given particle.

4,525,667

SYSTEM FOR OBSERVING A PLURALITY OF DIGITAL SIGNALS

Katsutoshi Sawano, Musashimurayama, and Tetsuharu Miyashita, Hachioji, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,678
Claims priority, application Japan, Oct. 17, 1981, 56-164937
Int. Cl.³ G01R *15/12, 23/16, 7/00;* **G09F** *9/30*
U.S. Cl. 324—140 R **3 Claims**



1. A signal observation system for analyzing digital signals, said system comprising:

a plurality of signal channels, each of said signal channels including:

input terminal means for receiving a digital signal;

comparator means coupled to said input terminal means for comparing the digital signal received by said input terminal means to a reference signal and producing a bistable logic signal in response to the comparison;

memory means coupled to said comparator means for storing said bistable logic signal;

switch means for providing a condition signal selected from among a plurality of condition signals, said plurality of condition signals including a logic "0" signal, a logic "1" signal, a logic "don't care" signal, a logic "UP" signal indicating a logic transition from "0" to "1" and a logic "DOWN" signal indicating a logic transition from "1" to "0", said switch means having a switch contact associated with each of said logic signals; and

condition detecting means coupling to said memory means and said switch means for comparing the bistable signal stored in said memory means to said condition signal and producing a coincidence signal when said bistable signal and said condition signals match;

logic means coupled to said condition detecting means of each of said plurality of signal channels for producing a logic signal in response to the logical product of said coincidence signals;

selecting means coupled to one of said memory means and to said logic means for providing an output signal selected from among the bistable signal stored in said one memory means and the logic signal produced by said logic means; and

display means coupled to the other of said memory means and to said selecting means for displaying the bistable signal stored in said other memory means and the output signal provided by said switch means.

4,525,668

SYSTEM FOR MEASURING ELECTRICAL OUTPUT OR ENERGY

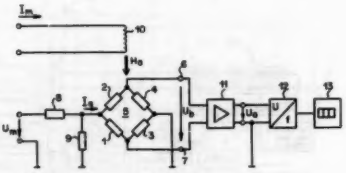
Heinz Lienhard, Zug, and Jan Petr, Oberwil, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Dec. 18, 1981, Ser. No. 332,218

Claims priority, application Switzerland, Dec. 24, 1980, 9569/80

Int. Cl.³ G01R *21/06, 33/00, 33/02*

U.S. Cl. 324—142 **10 Claims**



1. An apparatus for the measurement of electrical power including a multiplier receiving on an input thereof an electrical signal proportional to the voltage component of said electrical power, and being subjected to an external magnetic field proportional to the current component of said electrical power,

comprising, in combination,

a substantially flat electrical conductor disposed in a first plane, carrying a current proportional to said current component, and generating said external magnetic field;

said multiplier comprising a Wheatstone bridge including four ferromagnetic and magnetoresistive thin films having hard and easy axes, respectively, said thin films being disposed in a second plane substantially parallel to said first plane, and being coupled to said external magnetic field free of any magnetic core, said hard magnetic axes of each of said thin films extending along the direction of said external magnetic field, said thin films being electrically so interconnected as to form two pairs of electrically oppositely disposed thin films; and

means for generating auxiliary magnetic fields, and for applying said auxiliary magnetic fields to said multiplier, said means being so positioned, in relation to said thin films, that said auxiliary magnetic fields extend along said directions of the hard magnetic axes of said thin films, whereby, following the application of said auxiliary magnetic fields to said thin films, the magnetization of one of said two pairs of electrically oppositely disposed thin films resulting from the application of said external magnetic field thereto is rotated in a direction opposite to that of a correspondingly resulting magnetization of the other pair of electrically oppositely disposed thin films.

4,525,669

POWER MEASUREMENT IN AN ELECTRICAL DISTRIBUTION SYSTEM HAVING THREE OR MORE WIRES

Philip M. Holberton, Norcross; Bruce E. Randall, Alpharetta, and Jay K. Marshall, Marietta, all of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Dec. 20, 1982, Ser. No. 451,306

Int. Cl.³ G01R *21/00, 21/08*

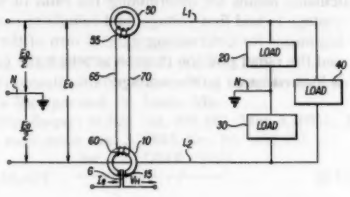
U.S. Cl. 324—142 **12 Claims**

1. A system for measuring alternating current transmitted over an electrical distribution circuit having at least three lines, one line being at ground potential and the other lines being at an elevated potential with respect thereto, the system comprising:

galvanomagnetic transducer means, including a magnetic circuit magnetically coupled to one of the elevated lines;

current transformer means magnetically coupled to each of the other elevated lines; and

means for magnetically linking each of the current transformer means and the magnetic circuit of the transducer means, whereby a magnetic flux is induced in the transducer means which is proportional to the vector sum of the currents in each of the elevated lines.



4,525,670

GENERATOR FOR GENERATING A ROTATIONAL SIGNAL IN ACCORDANCE WITH CHANGING SATURATION MAGNETIC FLUX DENSITY OF A MAGNETIC MEMBER

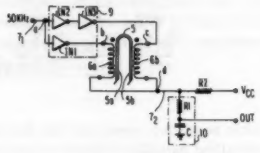
Selichi Miyagawa, and Takeshi Nakane, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 16, 1982, Ser. No. 399,145

Claims priority, application Japan, Jul. 17, 1981, 56-112550; Dec. 2, 1981, 56-194198

Int. Cl.³ G01B *7/14;* **G01P** *3/48*

U.S. Cl. 324—208 **6 Claims**



1. A generator for generating a rotation signal, comprising:

a magnetic member (**5**) having first and second portions;

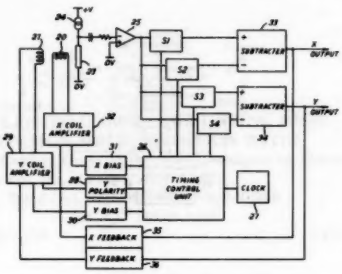
a rotatable member (**1**) including at least one permanent magnet (**2**, **21** or **22**) having at least one N pole and at least one S pole displaced circumferentially around said rotatable member, said N and S poles and said magnetic member being relatively spaced such that said N pole is adjacent said first portion when said S pole is adjacent said second portion; and

detection means for providing said rotation signal in accordance with changes in the saturation magnetic flux density of said magnetic member, said detection means comprising first and second electrical coil portions each adjacent a respective one of said first and second magnetic member portions, and an electrical processing circuit for applying intermittent pulse signals to said electrical coil portions which are out-of-phase with respect to one another, said electrical processing circuit comprising switching means (**9**) for alternately applying said pulse signals to one and then the other of said first and second coil portions, and a smoothing circuit (**10**) connected in parallel with each of said first and second coil portions and providing said rotation signal output.

4,525,671
APPARATUS FOR SENSING TWO COMPONENTS OF A MAGNETIC FIELD

David J. Sansom, Chertsey, England, assignor to EMI Limited, Hayes, England

Filed Sep. 8, 1982, Ser. No. 415,793
Claims priority, application United Kingdom, Sep. 9, 1981, 8127178
Int. Cl.[3] G01R *33/06;* H01L *43/08;* H03K *19/18*
U.S. Cl. 324—252 7 Claims



1. Apparatus for sensing first and second orthogonal components h_x and h_y of an external magnetic field h, said apparatus including a planar magnetoresistive element, said element comprising a magnetically anisotropic thin film having an easy axis of magnetization in the plane of the film, said film being provided with electrical contacts connectable to means for passing an electrical current through the film in a direction substantially parallel to said easy axis, said contacts also being connectable to detecting means for sensing a signal indicative of the resistivity of said film when said current is passed therethrough, said apparatus further including application means for selectively applying to the film a first magnetic bias field and a second magnetic bias field, said first bias field acting substantially at right angles to said easy axis in the plane of the film and said second bias field acting substantially parallel to said easy axis, and control means permitting said first and second bias fields to be applied to said element in a plurality of pre-determined relationships, said element, in use, being placed in said external magnetic field h with said component h_x lying in a direction at right angles to said easy axis in the plane of the film and said component h_y lying parallel to said easy axis, and said detection means sensing signals indicative of the resistivity of said film whilst said application means selectively applies said first and second bias fields in a plurality of different relationships, said relationships being chosen such that said components h_x and h_y may be derived from said signals.

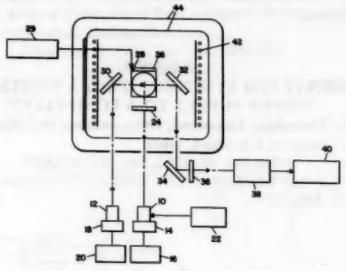
4,525,672
APPARATUS AND METHOD FOR LASER PUMPING OF NUCLEAR MAGNETIC RESONANCE CELL

Leo K. Lam, Canoga Park, and Edward Phillips, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 30, 1983, Ser. No. 480,608
Int. Cl.[3] G01R *33/08*
U.S. Cl. 324—304 7 Claims

1. A method for optically pumping an NMR cell of the type wherein an a.c. magnetic field torques the collective magnetic moment of the noble gas nuclei comprising the steps of:

(a) directing a beam of circularly polarized laser light at said cell; and

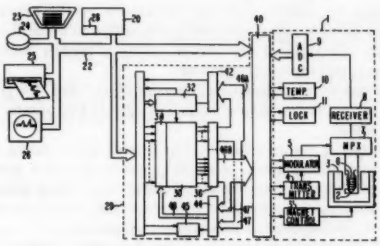


(b) shaping the spectral profile of said laser light to approximate the absorption profile of said cell.

4,525,673
NMR SPECTROMETER INCORPORATING A RE-ENTRANT FIFO

Edward H. Berkowitz, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 107,106, Feb. 26, 1979, Pat. No. 4,375,676, which is a division of Ser. No. 353,263, Mar. 1, 1982, Pat. No. 4,481,608. This application Mar. 12, 1984, Ser. No. 588,834
Int. Cl.[3] G01R *33/08*
U.S. Cl. 324—312 8 Claims



1. In an NMR spectrometer utilizing a stored program digital processor for execution of a desired sequence of operations, a first class of said operations directed to controlling the status of said spectrometer and another class of said operations directed to acquiring data from said spectrometer,

a digital sequence buffer apparatus including an input register and an output register and a plurality of intermediate registers for retaining a plurality of digital words, each said word comprising an operand portion for specifying the instantaneous configuration of said spectrometer and a persistence portion for specifying the persistence interval of each operand, and a repetition portion for specifying the desired number of sequential repetitions of the currently active word,

first means responsive to the persistence portion of said digital word for sustaining the currently active operand for the desired persistence interval,

second means responsive to the repetition portion for reinitiating the currently active operand at the completion of the persistence interval thereof, said second means operative to continue said repetitions until the operand has been repeated for the desired number of repetitions,

third means for advancing the content of said buffer toward said output register of said buffer apparatus when the persistence portion of the currently active word has been

completed for the number of sequential repetitions specified by said repetition portion, and means for re-introducing said sequence of instruction words to the input portion of said sequence buffer whereby said sequence is preserved.

4,525,674

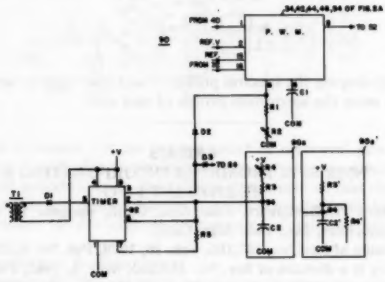
CIRCUIT FOR SYNCHRONIZING A SWITCHING POWER SUPPLY TO A LOAD CLOCK

Neil A. Kammiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jul. 28, 1982, Ser. No. 402,628

Int. Cl.³ H03K *1/17, 7/00, 17/00, 17/26*

U.S. Cl. 328—63 **10 Claims**



1. A synchronizing circuit for use in a power supply of the type which uses a waveform of predetermined shape for controlling the operation of the switchable power means contained therein, said supply being connected to a load having a master clock signal said signal having a predetermined frequency, said circuit comprising:

(a) means responsive to said master clock signal for generating a syncing signal for each cycle of said master clock signal;

(b) timing means connected to receive said syncing signal, said timing means generating pulses at a first predetermined rate in the absence of said syncing signal and generating pulses at a second predetermined rate in response to the occurrence of said syncing signal; and

(c) circuit means having an internal clock frequency and connected to receive said timing means pulses said circuit means generating said waveform of predetermined shape with (i) a first predetermined frequency when said pulses are generated at said first predetermined rate and (ii) a second predetermined frequency when said pulses are generated at said second predetermined rate said second frequency being synchronized to said master clock frequency.

4,525,675

ULTRA LINEAR FREQUENCY DISCRIMINATOR CIRCUITRY

Carl T. Richmond; Thomas A. Butler, both of Scottsdale, Ariz., and Joseph E. Andrews, Jr., San Jose, Calif., assignors to Motorola, Inc., Scahumburg, Ill.

Filed Apr. 7, 1983, Ser. No. 483,036

Int. Cl.³ H03K *5/00, 11/00, 9/06*

U.S. Cl. 328—140 **10 Claims**

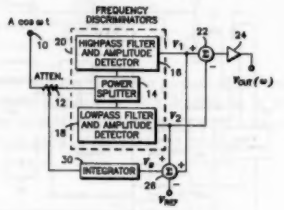
1. Ultra linear frequency discriminator circuitry comprising:

controllable attenuation means having a signal input, with varying frequency and amplitude a control input and an output, for providing different amounts of attenuation to signals applied to the signal input thereof in response to control signals applied to the control input thereof;

first and second discriminator circuits each having a linear response over a predetermined band of frequencies and with response slopes which are equal and of opposite sign;

a power splitter coupling each of said first and second discriminator circuits to the output of said controllable attenuation means;

signal combining means connected to receive output signals from said first and second discriminator circuits for combining the output signals to provide a discriminator circuitry output signal which is a linear function of the frequency of signals applied to the signal input of said controllable attenuation means; and



control signal generating means connected to receive the output signals from said first and second discriminator circuits and having an output connected to the control input of said controllable attenuation means for generating a control signal that maintains amplitudes of signals supplied to said power splitter from said controllable attenuation means constant whereby the discriminator circuitry output signal from said signal combining means is independent of the amplitude of signals applied to the signal input of said controllable attenuation means.

4,525,676

PSK DEMODULATION SYSTEM HAVING CARRIER FREQUENCY VARIATION COMPENSATION

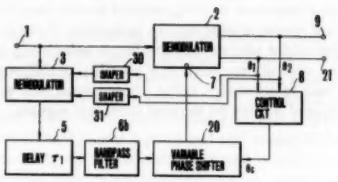
Masaaki Atobe, and Yoshimi Tagashira, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 351,258

Claims priority, application Japan, Feb. 24, 1981, 55-25709; Feb. 24, 1981, 55-25710

Int. Cl.³ H03D *3/02*

U.S. Cl. 329—50 **3 Claims**



1. A system for demodulation of phase shift keying signals comprising:

means, including a bandpass filter having an input and an output, which receives the phase shift keying signal for regenerating a carrier wave, said carrier wave passing through said bandpass filter;

demodulator means having an input and output for demodulating the phase shift keying signal in response to the regenerated carrier wave which is input from said carrier wave regenerating means to thereby produce a demodulated signal;

means for detecting phase variations in said regenerated carrier wave with respect to said demodulated signal; and

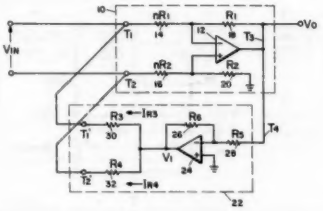
phase control means responsive to the output of the phase variation detecting means to correct the phase of said carrier wave passing through said bandpass filter by controlling the phase of said carrier wave at the output of said band pass filter.

4,525,677

DIFFERENTIAL AMPLIFIER HAVING HIGH COMMON-MODE REJECTION RATIO

William L. Rorden, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Oct. 12, 1983, Ser. No. 540,988
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—258 **4 Claims**



1. A differential amplifier comprising:

a first operational amplifier having an inverting and a non-inverting input terminal and a non-inverting output terminal which also serves as the output terminal of the differential amplifier;

a first resistor having one end connected to the inverting input terminal of the first operational amplifier and its other end forming the first of the differential input terminals of the differential amplifier;

a second resistor connected between the inverting input and non-inverting output terminals of the first operational amplifier;

a third resistor having one end connected to the non-inverting input terminal of the first operational ampliier and its other end forming the second of the differential input terminals of the differential amplifier; and

a fourth resistor connected between the non-inverting input terminal of the first operational amplifier and ground;

wherein the ratio of the value of the first resistor to the value of the second resistor is equal to the ratio of the value of the third resistor to the value of the fourth resistor; and

a fixed gain inverting amplifier having its input terminal connected to the output terminal of the differential amplifier and its output terminals connected to the input terminals of the differential terminals, said fixed gain inverting amplifier including:

a second operational amplifier being connected in a fixed gain inverting configuration having an input and an output terminal with its input terminal forming the input terminal of the fixed gain inverting amplifier; and

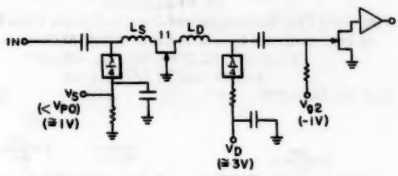
a fifth and a sixth resistor each having one end connected to the output terminal of the second operational amplifier and each of their other ends forming an output terminal of the fixed gain inverting amplifier.

4,525,678

MONOLITHIC LOW NOISE COMMON-GATE AMPLIFIER

Randall E. Lehmann, Garland; Gailon E. Brehm, and David J. Seymour, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,399
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—277 **12 Claims**



1. A microwave amplifier for amplifying an input signal provided over a line having a predetermined source impedance, comprising:

means for receiving said input signal from said line;

a first field-effect transistor comprising a gate, a source, and a drain, said transistor having said source thereof connected to said input means, said gate being grounded;

bias means connected to provide a bias current through said FET, said bias current being selected so that said transistor has a very low noise figure, said gate of said transistor having a width such that said transistor has a transconductance which is greater than the reciprocal of said source impedance at said selected bias current;

load impedance means, connected to the drain of said transistor to provide a load impedance which is greater than said source impedance; and

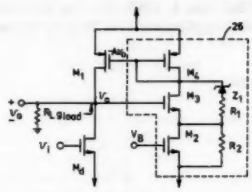
an additional amplifier stage, said additional amplifier stage comprising an interstage input which is connected to said drain of said field effect transistor.

4,525,679

HIGH GAIN AMPLIFYING STAGE BY OUTPUT CONDUCTANCE CANCELLATION

Stephen L. Wong, Oakville, and Clement A. T. Salama, Toronto, both of Canada, assignors to The University of Toronto Innovations Foundation, Toronto, Canada

Filed Dec. 23, 1982, Ser. No. 452,511
Int. Cl.³ H03F *3/16, 1/38;* **H03G** *3/18*
U.S. Cl. 330—277 **6 Claims**



1. A metal-oxide semiconductor (MOS) gain stage fabricated on an integrated circuit and having a load transistor, a driver transistor, a gain stage output taken between the load transistor and the driver transistor, and a variable attenuator connected between the output of the gain stage and an input of the load transistor, said variable attenuator including other MOS transistors, coupled together such that the output conductance of the load transistor is substantially independent of the operating point of the gain stage providing, by positive feedback, a cur-

rent generator dependent on the output voltage, the current generator having an effective negative output conductance which substantially cancels the total load conductance of the gain stage over a wide range of output voltages, and said output conductance cancellation constituting means effective such that the voltage gain of the stage is substantially increased.

4,525,680

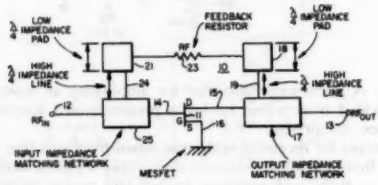
MICROWAVE/MILLIMETER WAVE AMPLIFIER WITH RF FEEDBACK

Jing-Jong Pan, Melbourne, and John B. Wilson, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 22, 1983, Ser. No. 488,427

Int. Cl.³ H03F *3/193, 3/60*

U.S. Cl. 330—277 **25 Claims**



11. A high frequency transistor amplifier circuit comprising:

an input terminal to which high frequency signals to be amplified are to be applied;

an output terminal from which high frequency signals amplified by said amplifier circuit may be derived;

at least one high frequency transistor stage coupled between said input terminal and said output terminal; and

a feedback network coupled between said output terminal and said input terminal, said feedback network including a feedback resistor and high frequency impedance means for coupling said resistor to said terminals, for bypassing thermal noise generated by said resistor away from said at least one high frequency transistor stage, and for providing high attenuation near the frequency of said high frequency signal.

4,525,681

NARROW-BAND AMPLIFIER, MORE SPECIFICALLY TELEVISION INTERMEDIATE FREQUENCY AMPLIFIER

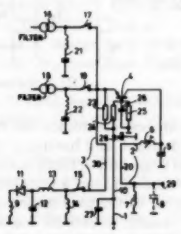
Karl H. Kupfer, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,536

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213406

Int. Cl.³ H03F *3/60*

U.S. Cl. 330—286 **3 Claims**



1. A narrow-band amplifier in which an input line is provided on a printed circuit board, at least partly, very closely to an output line of the amplifier, characterized in that a direct current supply line of the amplifier is arranged between the input and output lines, two capacitors being connected to the direct current supply line at a predetermined distance from each other, one of the capacitors forming substantially a short-circuit for the signal frequency and the other being dimensioned such that together with a section of the direct current supply line located between the two capacitors, said other capacitor provides a parallel-resonant circuit which resonates in the region of the signal frequency of the amplifier and that this line section is located in the region of closely adjacent line sections of the input and output lines of the amplifier.

4,525,682

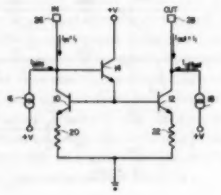
BIASED CURRENT MIRROR HAVING MINIMUM SWITCHING DELAY

Stephen H. Lai, Arlington Heights, and Gopal K. Srivastava, Buffalo Grove, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 7, 1984, Ser. No. 577,904

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—288 **6 Claims**



1. A transistorized current mirror having minimum delay comprising:

an input terminal for receiving an input signal;

an output terminal;

current mirror means for developing a current in the output terminal mirroring the current supplied to the input terminal;

means supplying a bias current to said input terminal; and

means supplying an offset current to said output terminal to nullify the effects of said bias current in the output of said current mirror.

4,525,683

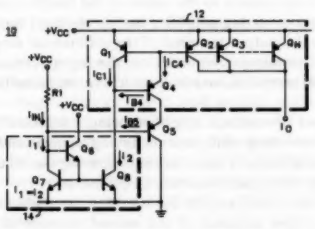
CURRENT MIRROR HAVING BASE CURRENT ERROR CANCELLATION CIRCUIT

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1983, Ser. No. 558,254

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—288 **9 Claims**



1. A current mirror circuit, comprising:

first current mirror circuit means having an input and an output, for generating a bias current;

first error correction circuit means, connected to said first current mirror circuit, for generating a first correction signal directed only to the input of said current mirror circuit; and

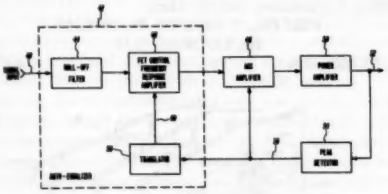
second error correction circuit means, connected to said first error correction circuit means and the input of said first current mirror circuit means, for generating a second correction signal directed only to the input of said current mirror circuit, whereby the current error caused by said first error correction circuit means is reduced.

4,525,684

AUTO-EQUALIZER APPARATUS

Richard L. Majefski, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1984, Ser. No. 623,902
Int. Cl.[3] H03F 1/91; H03H 5/00
U.S. Cl. 330—304 **3 Claims**



1. Auto-equalizer apparatus comprising, in combination:

roll-off filter means including first signal input means and output means;

means for supplying a pulse train type signal to be equalized to said input means of said filter means;

variable Q tuned circuit means, including second signal input means and apparatus signal output means, and further including variable impedance resistance means having a control input;

means connecting said output means of said filter means to said signal input means of said tuned circuit means; and

peak detector means, connected between said apparatus signal output means of said tuned circuit means and said control input means of said tuned circuit means, for providing thereto a feedback control signal which adjusts the resistance of said variable impedance resistance means toward a value which tends to maintain a substantially constant amplitude train of pulses at said apparatus output means.

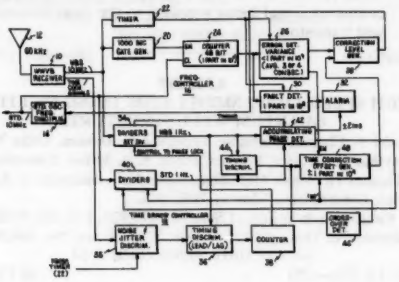
4,525,685

DISCIPLINED OSCILLATOR SYSTEM WITH FREQUENCY CONTROL AND ACCUMULATED TIME CONTROL

Robert J. Hesselberth, Penfield; Thomas P. Donaher, Rochester, and Joel E. Sandahl, Fairport, all of N.Y., assignors to Spectracom Corp., East Rochester, N.Y.

Filed May 31, 1983, Ser. No. 499,737
Int. Cl.[3] H03L 7/06
U.S. Cl. 331—10 **39 Claims**

32. In a disciplined oscillator system utilizing a source of pulses repetitive at fixed intervals of time and having standard oscillator means having a standard frequency output which is variable in frequency in response to a control signal, time controller means comprising means responsive to said standard frequency output and said fixed interval pulses for providing a train of reference pulses time-locked to said fixed interval pulses, and means responsive to the phase difference between



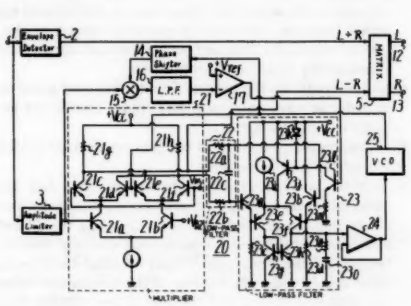
said fixed interval pulses and said reference pulses for producing said control signal.

4,525,686

PHASE-LOCKED LOOP CIRCUIT WITH VARIABLE BANDWIDTH FILTER

Satoshi Yokoya, Chofu, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,106
Claims priority, application Japan, Apr. 15, 1981, 56-56796
Int. Cl.[3] H03L 7/08
U.S. Cl. 331—17 **10 Claims**



1. A phase-locked loop circuit comprising:

oscillator means for producing an oscillation signal;

phase comparator means for phase-comparing an input signal with said oscillation signal to produce a phase-compared signal;

detecting means for detecting when said phase-locked loop circuit is locked within a predetermined frequency range and for producing a lock detecting signal corresponding to said detection in response to said input signal and said oscillation signal; and

filter means for producing an output signal in response to said phase-compared signal and said lock detecting signal to lock the frequency of said oscillation signal to the frequency of said input signal, said filter means including variable current source means for producing a variable current having a first value in the presence of and a second value in the absence of said lock detecting signal, a filter circuit supplying said output signal, and control means connected to said filter circuit for producing said output signal in response to said variable current and said phase-compared signal, said control means including a differential amplifier comprised of first and second transistors, each having a base, collector and emitter terminal, said

filter circuit being connected to the collector terminal of one of said transistors, said variable current being supplied to the emitter terminals of said transistors, and said phase-compared signal being supplied to the base terminals of said transistors.

4,525,687

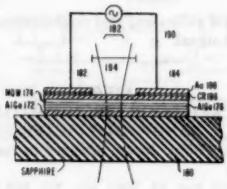
HIGH SPEED LIGHT MODULATOR USING MULTIPLE QUANTUM WELL STRUCTURES

Daniel S. Chemla, Rumson; Theodoor C. Damen, Colts Neck; Arthur C. Gossard, Warren; David A. B. Miller, Lincroft, and Thomas H. Wood, Highlands, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 470,329, Feb. 28, 1983, abandoned. This application Dec. 2, 1983, Ser. No. 558,545

Int. Cl.³ H01L *33/02;* **G02B** *5/14*

U.S. Cl. 332—7.51 **25 Claims**



1. A semiconductor apparatus including:

modulator means jointly responsive to an applied electric field and a first optical signal for translating the first optical signal into a second optical signal, the second optical signal being an amplitude modulated version of the first optical signal, the first and second optical signals being at substantially equal wavelengths, and

means for applying the electric field to said modulator means in order to vary an optical absorption coefficient and an index of refraction therefor,

the semiconductor apparatus being characterized in that the modulator means includes

a multiple layer heterostructure having first and second material layers having first and second bandgaps, respectively, and a semiconductor layer having a third bandgap and being positioned between said material layers, the bottom of the conduction band of said semiconductor layer being below the bottom of the conduction bands of said material layers, and the top of the valence band of said semiconductor layer being above the tops of the valence bands of said material layers, the thickness of said semiconductor layer being sufficient for carrier confinement effects within said semiconductor layer to influence the optical properties of said multiple layer heterostructure.

4,525,688

OSCILLOSCOPE SIGNAL INPUT CIRCUIT INCLUDING AN ATTENUATOR

Desmond L. Murphy, Portland, and Warren K. Wimmer, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 1, 1983, Ser. No. 518,904

Claims priority, application Japan, Aug. 2, 1982, 57-133846

Int. Cl.³ H01P *1/22*

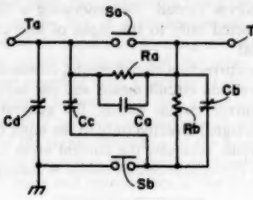
U.S. Cl. 333—81 R **2 Claims**

1. A signal input circuit, comprising:

a first switch connected between an input and an output terminal;

an attenuator network comprising a first parallel resistor-capacitor combination connected between said input and output terminals, and a second parallel resistor-capacitor combination connected between said output terminal and a common terminal; and

a second switch connected between said common terminal and ground,



wherein said first and second switches are operated in opposite state to each other.

4,525,689

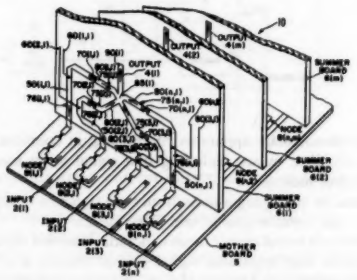
N×M STRIPLINE SWITCH

Gary L. Wagner, Menlo Park, and Michael J. Serrone, Sunnyvale, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 5, 1983, Ser. No. 558,215

Int. Cl.³ H01P *1/15*

U.S. Cl. 333—104 **4 Claims**



1. An n by m switch for selectively switching n electromagnetic input signals onto m outputs, comprising:

n electrically conductive inputs, each of which may convey an input signal, where n is a positive integer;

m electrically conductive outputs, each of which may convey no more than one of the input signals, where m is a positive integer; wherein

each input is coupled to each output via a switching node that permits the associated input signal to be switched onto the associated output, depending upon the activation of a d.c. control current applied to each switching node; and

each input can be simultaneously switched onto any number of outputs;

wherein each output comprises an output transmission line, n connection transmission lines each having first and second ends, and a summation junction comprising the common intersection of the n connection transmission lines and the output transmission line, the first ends of the connection transmission lines being respectively connected to that output's n switching nodes corresponding to the n inputs, and the second end of each connection transmission line being connected to the summation junction; wherein

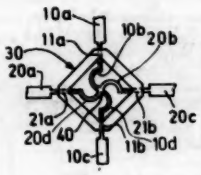
the n connection transmission lines have lengths such that, when one of the input signals is switched onto said output, the sum of the admittances of the unswitched n−1 connection transmission lines, measured between the summation junction and ground, is substantially equal to zero.

4,525,690

N-PORT COUPLER

Frans C. De Ronde, Lesigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,648
Claims priority, application France, May 28, 1982, 82 09383
Int. Cl.[3] H01P 5/16, 5/18
U.S. Cl. 333—116 8 Claims



1. An n-port coupler for coupling n strip-type transmission line ports, said coupler comprising:

(a) n strip-type stubs each electrically-connected at one end to a respective one of the ports and electrically-connected at an opposite end to the other stubs in a central zone of the coupler, said stubs each having a width substantially smaller than the strip width of the ports; and

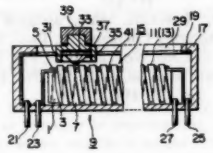
(b) a strip-type transmission line loop coupled to the stubs at locations which are symmetrically disposed with respect to the central zone, said loop having a width substantially equal to the strip width of the ports and having a mean length effecting establishment of a resonant frequency just below a predefined passband of the coupler.

4,525,691

VARIABLE DELAY LINE

Kazuo Kameya, Saitama, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Feb. 18, 1983, Ser. No. 467,636
Claims priority, application Japan, Feb. 22, 1982, 57-27137
Int. Cl.[3] H03H 7/32
U.S. Cl. 333—139 8 Claims



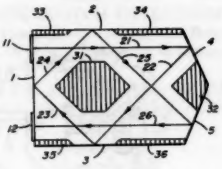
1. A variable delay line, comprising; an inductance element comprising a conductor formed into a plurality of turns having a prescribed pitch, with a space being maintained between adjacent turns, a capacitor connected between said conductor and ground at each turn, a fixed contact array consisting of fixed contacts formed on said conductor at each turn, and a movable contact element for slidingly contacting said fixed contact array, said movable contact element being capable of engaging single ones of said fixed contacts at a first set of positions thereof, and being capable of engaging two adjacent ones of said fixed contacts at a second set of positions thereof.

4,525,692

ELECTROACOUSTIC DELAY LINES

Roger G. Claes, Sint-Truiden, Belgium, assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 22, 1983, Ser. No. 487,648
Int. Cl.[3] H03H 9/36
U.S. Cl. 333—142 16 Claims



1. An electroacoustic delay line comprising a solid transmission medium and transducer means bonded to the transmission medium, said transmission medium assuming a generally pentagonal profile characterized by:

(a) a first side,

(b) second and third sides extending substantially perpendicularly from the first side and in a substantially parallel relationship with each other,

(c) a fourth side extending from the second side so as to form a first obtuse angle with the second side, and

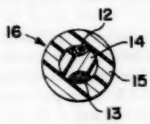
(d) a fifth side extending from the third side, so as to form a second obtuse angle with the third side, so that said fourth and fifth sides form a third obtuse angle at a point of intersection, said first and second obtuse angles being substantially equal and said third obtuse angle is substantially equal to 135 degrees.

4,525,693

TRANSMISSION LINE OF UNSINTERED PTFE HAVING SINTERED HIGH DENSITY PORTIONS

Hirosuke Suzuki, Kotesashi, and Hajime Ohki, Komae, both of Japan, assignors to Junkosha Company Ltd., Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,684
Claims priority, application Japan, May 1, 1982, 57-73821
Int. Cl.[3] H01P 3/16
U.S. Cl. 333—236 2 Claims



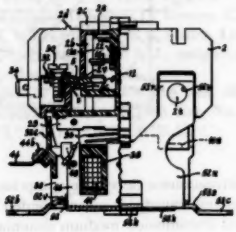
1. An electromagnetic wave energy transmission line comprising a tape of expanded, porous, initially unsintered polytetrafluoroethylene, said tape being wound to form a substantially cylindrical cross section elongate transmission line, at least portions, but not all of the initially unsintered polytetrafluoroethylene within the cross section of said transmission line, being sintered along the entire length of said transmission line to produce high density portions of sintered polytetrafluoroethylene along its length, which high density portions retard the speed of electromagnetic energy such as to prevent rotation of the electric field within the transmission line.

4,525,694

ELECTROMAGNETIC CONTACTOR

William G. Dennison, Cedarburg; Kenneth R. Horr, Shorewood, and Robert I. Kindler, Grafton, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 23, 1983, Ser. No. 535,107
Int. Cl.[3] H01H 50/02
U.S. Cl. 335—132 18 Claims



1. An electromagnetic contactor constructed so as to enable economical assembly thereof without any screws or similar fasteners comprising:

an upper housing part of insulating material having an opening at the bottom and a contact compartment therein for slidably receiving and slidably accommodating a movable contact carrier and through-slots in opposite end walls thereof for receiving stationary contacts;

an insulating movable contact carrier having resiliently-biased movable contacts mounted thereon and constructed to be inserted or dropped into said contact compartment through said opening;

complementary inner walls in said contact compartment of said upper housing part and on said contact carrier for freely receiving said contact carrier into said contact compartment when dropped therein and guiding the same within said compartment for relative vertical actuation with respect thereto;

stationary contacts inserted with interference fit through said slots in said opposite end walls of said upper housing part into said contact compartment for engagement by said movable contacts when said contact carrier is actuated and terminals on said stationary contacts accessible on the outside of said upper housing part;

leaf spring retaining means at the bottom of said contact carrier;

an armature having a slot therethrough;

a retainer leaf spring inserted through said slot in said armature and pressed sideways at its ends into said leaf spring retaining means to securely clamp said armature to said contact carrier;

an electromagnet comprising an insulation encapsulated operating coil unit having interfitting portions with said upper housing part to maintain said coil unit fixed with respect to said upper housing part and a magnetic frame about the coil of said coil unit so as to magnetically attract said armature when said coil is energized;

an armature return spring between said coil unit and said armature;

a lower housing part placed over and secured to said upper housing part and embracing said magnetic frame and said coil unit to retain the same clamped with respect to said upper housing part with said return spring partly compressed between said coil unit and said armature;

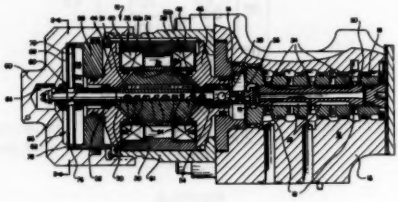
and said insulation encapsulated coil unit comprising integral resilient abutments that are engaged by said lower housing part to take up looseness between said coil unit and said lower housing part and thereby hold said coil unit tightly against said upper housing part.

4,525,695

FORCE MOTOR WITH BALL MOUNTED ARMATURE

Shih Y. Sheng, Santa Ana, and Ray A. York, Villa Park, both of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 4, 1984, Ser. No. 596,489
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—262 4 Claims



1. A force motor comprising:

a casing

first and second pole pieces arranged on opposite ends of said casing;

a magnetic assembly located within said casing and between said pole pieces, said magnetic assembly including a permanent magnet and one or more electrical coils;

an armature that is movable between said pole pieces in response to an input signal to said magnetic assembly;

a spring assembly having at least one cantilevered spring, said spring assembly being connected to said armature and opposing movement of said armature from a reference position, the opposing force of said spring assembly when said armature is out of said reference position being greater than the force of the permanent magnet of the magnetic assembly with no input current to the coils;

a tube assembly that is concentrically sleeved within said magnetic assembly;

a plurality of balls that are circumferentially maintained between the armature and the tube assembly, said balls contacting both the armature and the tube assembly to longitudinally guide said armature in said tube assembly; and

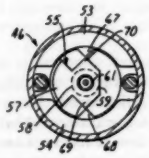
at least one retainer for circumferentially maintaining said balls, said retainer including respective openings corresponding to each ball.

4,525,696

DRIVER FOR ROTATING A MAGNETIC PLAYBACK HEAD

Peter J. Vogelgesang, Roseville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 211,265, Nov. 28, 1980, Pat. No. 4,433,351.
This application Mar. 10, 1983, Ser. No. 473,996
Int. Cl.[3] H01F 7/08
U.S. Cl. 335—272 3 Claims



1. A driver for rotating a magnetic playback head affixed thereto comprising

(a) a housing,

(b) an armature rotatably mounted within said housing,

(c) at least two field magnets affixed at spaced intervals within said housing and positioned around the axis of rotation for said armature,

(d) a driving coil affixed in said housing concentric with at least a portion of said armature whereby a current passing through said coil develops a continuously variable magnetic field polarizing said armature and causing a continuously variable preferential attraction of said armature toward an adjacent one of said field magnets and a corresponding continuously variable repulsion of said armature from an adjacent other of said field magnets, thereby tending to rotate said armature a direction and distance continuously proportional to the magnitude and polarity of said current, and

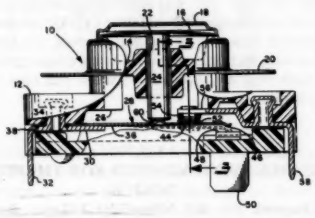
(e) means for concentrating the magnetic flux from said field magnets so as to return said armature to a home position when no current is applied to said coil.

4,525,697

THERMALLY RESPONSIVE CONTROLLER AND SWITCH ASSEMBLY THEREFOR

William H. Jones, Villa Park, and Worthy L. Chambers, Lombard, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 13, 1982, Ser. No. 449,041
Int. Cl.³ H01H *37/52*
U.S. Cl. 337—354 **18 Claims**



1. A thermally responsive switch controller assembly comprising:

(a) body means having a plurality of spaced electrical terminals mounted thereon and adapted for circuit connection thereto;

(b) first stationary contact means mounted on said body means and connected to one of said terminals;

(c) second stationary contact means disposed on said body means in spaced relationship to said first contact means and connected to another of said terminals;

(d) blade means having a first portion thereof stationary with respect to said body means and a second portion moveable with respect to said first and second stationary contact means, said second portion incuding moveable contact means;

(e) actuator means including thermally responsive means operative in response to experiencing a pre-selected temperature to move said blade means from a position completing a first circuit through said first stationary contact means to a position completing a second circuit through said second stationary contact means in which position said first circuit is broken;

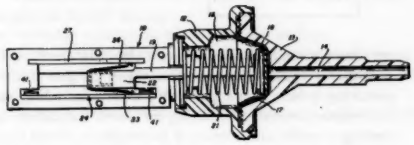
(f) said blade means second portion having a resiliently flexible stem attached to said stationary portion and a substantially rigid first tongue means and resiliently flexible second tongue means extending in cantilever from said stem, said first tongue means including a first moveable contact, said second tongue means including a second moveable contact and said actuator means includes a member operatively contacting said first tongue means, whereupon exposure of said thermal means to said preselected temperature said actuator member moves said first tongue means by resilient flexing of said stem portion for effecting breaking of said first circuit and said second tongue is moved to effect completing said second circuit and thereafter upon further temperature increase further movement of said member substantially is absorbed by said resilient flexing and said second tongue means.

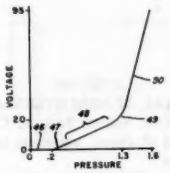
4,525,698

PNEUMATIC SWITCH POTENTIOMETER

Arnold S. Louis, Hastings-on-Hudson, and Robert P. Wiener, White Plains, both of N.Y., assignors to Litton Systems, Inc., Mount Vernon, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,216
Int. Cl.³ H01L *10/10;* **H01C** *10/38*
U.S. Cl. 338—39 **5 Claims**





1. A pneumatically actuated pressure transducer having two terminals, a collector, and a wiper assembly which is movable from a "Switch Open Circuit" position through a range of positions wherein the transducer has a varying voltage output, said pressure transducer comprising:

a potentiometer element including;

a high thermal conductivity substrate comprising a base for said potentiometer element, a resistance path coated onto said substrate, and an area of non-abrasive insulating material adjacent a portion of said resistance path, wherein an area of low resistance material comprises a first portion of said resistance path, an area of high resistance material comprises a second portion of said resistance path, and said low resistance material overlaps said high resistance material to form a transition zone, and

a wiper element movable from said insulating material onto and across said resistive path, whereby the output of said transducer varies from Switch Open Circuit to a first voltage value according to a first output curve, and from said first voltage value to a second higher voltage value according to a second output curve.

4,525,699

ELECTRONIC MONITORING SYSTEM WITH MALFUNCTION INDICATOR

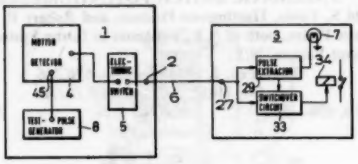
Robert Buck, Neukirch; Michael B. Friedrich, Kressbronn; Hans D. Gesthuysen, Essen-Kettwig, and Gerd Marhofer, Essen-Bredeney, all of Fed. Rep. of Germany, assignors to i f m electronic GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,853
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205737
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—512 **11 Claims**

1. In an electronic monitoring system including a detector sensitive to an ambient condition for generating on an output

thereof a useful signal assuming either of two levels in dependence upon the ambient condition being monitored, the combination therewith of:

a source of periodically recurrent test pulses connected to a control input of said detector for giving rise to a corresponding train of checking pulses superimposed upon said useful signal on at least one of said levels thereof; and



supervisory means coupled to said output for deriving from said useful signal a load-control signal purged from said checking pulses, said supervisory means including pulse-responsive means for emitting an alarm indication upon sensing a malfunction-induced interruption of said train of checking pulses in the presence of said one of said levels.

4,525,700

FIRE ALARM SYSTEM

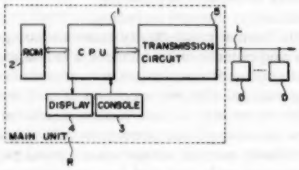
Tetsuo Kimura, Tokyo; Seiichi Tanaka, Chiba, and Takashi Suzuki, Tokyo, all of Japan, assignors to Nittan Company, Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,108

Claims priority, application Japan, Oct. 27, 1982, 57-187495

Int. Cl.³ G08B *26/00*

U.S. Cl. 340—518 **6 Claims**



6. A fire alarm system comprising:

a plurality of sensor terminal means separately connected to a transmission line, each of the sensor terminal means transmitting digital data as response data indicative of presence of a fire when accessed by an address signal corresponding to an address of the respective sensor terminal means;

a main unit means connected to said plurality of sensor terminal means through the transmission line for repeatedly accessing the plurality of sensor terminal means and for comparing the response data from each sensor terminal means with a first reference value; and

when said main unit means determines that response data from one of the sensor terminal means exceeds the first reference value, the main unit means then compares the response data from other sensor terminal means with a second reference value, and said main unit means then determining that a fire has broken out when the number of sensor terminal means supplying response data exceeding the second reference value is greater than a predetermined number, and thereafter supplying information indicating existence of a fire.

4,525,701

SECURITY ALARM ARRANGEMENT

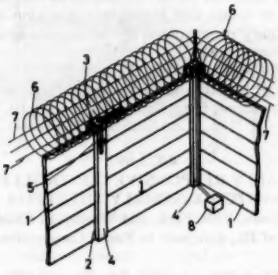
Michael P. Leih, 55, 4th Ave., Edenvale, Transvaal, South Africa (1610)

Filed Aug. 25, 1982, Ser. No. 411,341

Claims priority, application South Africa, Mar. 16, 1982, 82/1747

Int. Cl.³ G08B *13/12*

U.S. Cl. 340—541 **7 Claims**



1. A security installation including a deterrent wire arranged to substantially describe a hollow cylinder in general configuration and at least one longitudinally extending, electrically conductive wire passing through the cylindrical deterrent wire in the general direction of the axis thereof, the longitudinally extending wire and deterrent wire being connected to an alarm system such that any contact between the two triggers the alarm system.

4,525,702

FLEXIBLE TYING MEMBER FOR THEFTPROOF DEVICE

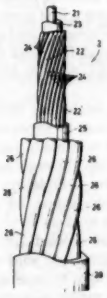
Tadao Kitagawa, No. 4-7, Minamidai 2-chome, Kamifukuoka-shi, Saitama-ken, Japan (356); Yutaka Kosuge, No. 23-3-19-604, Sayamadai 3-chome, Sayama-shi, Saitama-ken, Japan (350-13), and Yoichiro Noda, No. 3308, Kubota, Otsukacho, Miyazaki-shi, Miyazaki-ken, Japan (880)

Filed Sep. 28, 1982, Ser. No. 425,325

Claims priority, application Japan, Oct. 9, 1981, 56-161844; Nov. 17, 1981, 56-184285; Nov. 17, 1981, 56-184286

Int. Cl.³ G08B *29/00;* **B62H** *5/00;* **G02B** *5/14*

U.S. Cl. 340—556 **9 Claims**



1. In a theftproof device including an elongate flexible tying member, an optical fiber longitudinally extending through said flexible tying member, a pair of photoelectric elements arranged at opposite ends of said optical fiber, and means responsive to a change in an electrical signal generated by one of said photoelectric elements, which corresponds to a change in a

photo signal generated by the other of said photoelectric elements and transmitted in said optical fiber, for performing a warning function, the improvement wherein said elongate flexible tying member comprises a first layer including one of said optical fiber and at least one electric wire which longitudinally extends through said flexible tying member and is electrically connected to at least one of said photoelectric elements, a second layer concentrically disposed around said first layer and including the other of said optical fiber and said at least one electric wire, and a third layer concentrically disposed around said second layer and including at least one mechanically reinforcing member longitudinally extending through said flexible tying member

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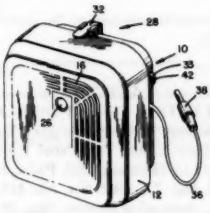
4,525,703

PORTABLE SMOKE ALARM

Joseph P. Bellino, Shelton, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,361
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—628 **3 Claims**



1. In a portable alarm having a smoke detecting mechanism, a signal alarm means, and a compact foraminous housing enclosing the components in a small package, an electric circuit for selectively connecting and disconnecting the smoke detecting mechanism and the alarm means for respectively arming and unarming the alarm, said electric circuit comprising:

an elongated electrical lead connected at one end thereof to a selected one of said smoke detecting mechanism and said alarm means, said electrical lead extending visibly outside said housing from said one end thereof,

first connector means connected to the other one of said smoke detecting mechanism and said alarm means,

second connector means on the other end of said electrical lead to connect selectively to said first connector means to complete said electric circuit through said electrical lead so as to thereby arm the portable alarm, and

said housing having extendable thin hanger means thereon capable of being reversed, said hanger means being adapted for hanging over a door top in open and closed door position or, upon reversal, to assume a compact position in contact with said housing,

whereby said electrical lead forms a hanging appendage on the exterior of the housing to indicate in a highly visible form the armed/unarmed condition of the alarm.

4,525,704

ENZYMATIC TOXIC GAS SENSOR

Donald N. Campbell, Timonium, and John C. Schmidt, Baltimore, both of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Nov. 9, 1983, Ser. No. 550,272
Int. Cl.³ G08B *17/10*; C12Q *1/00*
U.S. Cl. 340—632 **19 Claims**

7. A dual enzymatic toxic gas sensor wherein the chemical reactions therein are activated by diffusion within the sensor, said sensor comprising:

a first sensor having:

a reservoir containing a buffered electrolyte;

a wick attached at one end thereof to said reservoir;

a porous membrane having one broadside adapted for interfacing with the ambient air;

a structure attached to the other broadside of said membrane, said structure having an enzyme covalently attached thereto;

an electrochemical cell means having a sensing electrode, a reference electrode and a counter electrode; said sensing electrode spaced from said structure and adapted to react with reaction products of said enzyme to generate an electrical current;

substrate means adapted to receive the other end of said wick and containing a substrate which is dissolvable by said buffered electrolyte and diffuses to said enzyme to react with said enzyme in the absence of toxic gases;

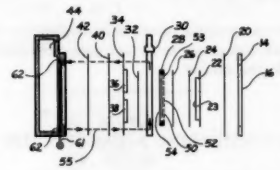
a second sensor having:

a reservoir containing a buffered electrolyte;

a wick attached at one end thereof to said reservoir;

a porous membrane having one broadside adapted for interfacing with the ambient air;

removable cover means normally covering said one broad-



side from interfacing with ambient air and adaptable to be removed therefrom;

a structure attached to the other broadside of said membrane, said structure having an enzyme covalently attached thereto;

an electrochemical cell means having a sensing electrode, a reference electrode and a counting electrode; said sensing electrode spaced from said structure and adapted to react with reaction products of said enzyme to generate an electrical current;

substrate means adapted to receive the other end of said wick and containing a substrate which is dissolvable by said buffered electrolyte and diffuses to said enzyme to react with said enzyme in the absence of toxic gases; and

circuit means including a bridge circuit, summing means and alarm means responsive to each of said electrochemical cells from said first and second sensors to generate a signal of one value due to the presence of toxic gases and a signal of another value due to the absence of toxic gases for activating said alarm means and responsive to the removal of said cover means to generate one of said signals in response to the electrical current from said electrochemical cell in said second sensor.

4,525,705

SYSTEM FOR DETECTING THE PRESENCE OF A YARN ON A CONTINUOUS SPINNING FRAME

Jacques Edmé, Sainghin en Melantois, and Etienne Deffontaine, Ennevelin, both of France, assignors to Centre Technique Industriel Dit: Insttiut Textile de France, Boulogne Billancourt and Etablissement Public Dit: Agence Nationale de Valorisation de la Recherche (Anvar), Paris, both of, France

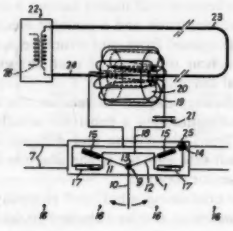
Filed Jul. 6, 1982, Ser. No. 395,359
Claims priority, application France, Jul. 6, 1981, 81 13274
Int. Cl.³ D03D *51/28*
U.S. Cl. 340—677 **10 Claims**

1. a system for detecting the presence of a yarn strand on a textile machine which comprises:

sensor means for detecting the presence of a yarn strand, said

sensor means including a cylindrical-shaped magnetic core, an electric circuit including a conductor wound around said magnetic core and a switch to generate an electric signal in reponse to the presence of a yarn strand;

means for moving said sensor means across courses of yarn strands on said textile machine;



a fixed loop conductor including a leg portion traversing said cylingdrically-shaped magnetic core and disposed parallel to a path of movement of said sensor means;

means for generating oscillations in said looped conductor; and

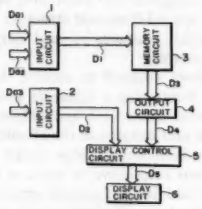
means for detecting a variation in oscillations in said looped conductor in response to said generated electric signal in said electric circuit.

4,525,706

MISFEED MONITORING APPARATUS FOR TRANSFER PRESS

Yoshinori Nishikawa, Kanazawa, and Iwashige Takahashi, Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,506
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **3 Claims**



1. A misfeed monitoring apparatus for a transfer press of a type in which feeder stroke is changeable, comprising:

display means for providing a work station display at each of a plurality of display positions, the number of display positions equalling the number of said work stations, which number changes as the feeder stroke changes; and

flickering means for flickering the display of any work stations at which misfeeding takes place.

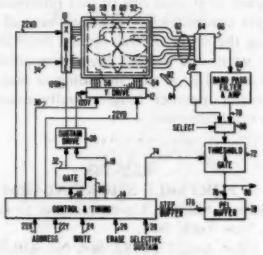
4,525,707

GAS PANEL INTERROGATION BY SELECTIVE SUSTAIN

Harry S. Hoffman, Jr., Saugerties; Donald R. Thompson, and Luther L. Zimmerman, both of Woodstock, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,526
Int. Cl.³ G09F *9/30*
U.S. Cl. 340—707 **10 Claims**

1. A gas panel system comprising means including addressing means for executing a selective sustain cycle with the first half of the sustain drive at least partially missing at the positions of all or a large group of cells of the panel so as to constitute, at most, a partial-sustain signal having no independent effect, and



means for supplying the missing half cycle component to a particular cell or cells by operation of said addressing means,

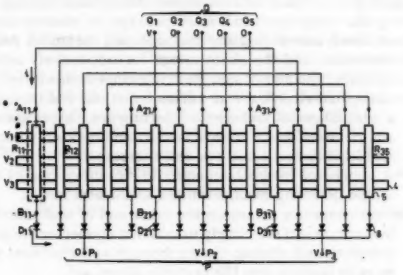
so that the information content at the addressed cells can be read optically.

4,525,708

THERMOELECTRIC EFFECT DISPLAY DEVICE

Michel Hareng; Robert Hehlen; Philippe Marcenac; Serge Le Berre; Pierre Leclerc, and Jean-Noël Perbet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,557
Claims priority, application France, Aug. 25, 1981, 81 16218
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—713 **4 Claims**



1. A display device for displaying at least one writing line consisting of characters in response to an incident electric signal, comprising:

a smectic liquid crystal layer;

two crossed systems of electrodes provided on opposite sides of said layer;

electric control means reacting to the content of the incident electric signal to provide current for predetermined periods to selected electrodes of one of said systems so as to establish successive heating and cooling phases in liquid crystal strips adjacent said selected electrodes, and for selectively applying across those of the strips of said layer which are in a cooling phase an electric field to produce a selected optical effect;

said one of said systems of electrodes being heated comprising N electrodes and said system of electrodes crossed with said one of said systems comprising M electrodes, where N>M to define a rectangular display array, each of said N electrodes connected in series with a respective non-linear resistance element, said N electrodes of said

one electrode system being shorter than said M electrodes of the other crossed electrode system; and

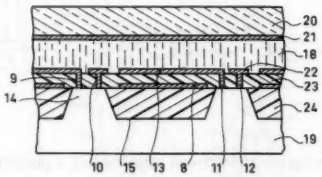
said control means comprising means for selectively applying a first voltage to said M electrodes of said other crossed electrode system to produce said electric field and means for selectively applying a second voltage substantially smaller than said first voltage across opposite ends of selected ones of said N electrodes to implement multiplexing of said two electrode systems on two levels, including a first multiplexing level in which the N electrodes of said one electrode system are multiplexed to produce a heating current through selected of said N electrodes and a second multiplexing level for selectively applying said electric field across selected of said electrodes of said first and second electrode systems.

4,525,709

ELECTRICALLY CONTROLLED DISPLAY DEVICE

Michel Hareng; Jean-Noël Perbet, and Michel Defrance, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,706
Claims priority, application France, Aug. 25, 1981, 81 16216
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—719 **7 Claims**



1. A display device comprising:

a cell intended to display images by electrically controlling elementary display pixels formed on a first surface of a substrate wherein said substrate is produced from a substance of which the resistance is a decreasing function of the applied voltage, and wherein each pixel comprises a first and second electrode forming a capacitor, the material of which varies in optical properties as a function of an electrical field generated across said capacitor, each pixel being connected to electrical connections via a varistor element corresponding to a portion of the said substrate, wherein said first surface of the said substrate which is adjacent the said pixels comprises recesses which delimit islets; the said recesses being filled with a dielectric substance having a lower permittivity than that of the said substrate, each islet comprising one of said varistor elements.

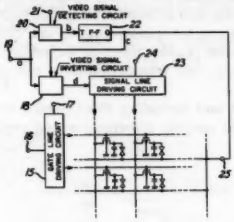
4,525,710

PICTURE DISPLAY DEVICE

Hideo Hoshi, and Hitoshi Kamamori, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,384
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—784 **12 Claims**

1. In a picture display device having field effect transistors deposited on a semiconductor layer formed on an insulating substrate in a column and row configuration; a first electrode which is one electrode of said field effect transistor; a second electrode which is a transparent electrode deposited on a transparent substrate opposite to said first electrode; and a liquid crystal held between the first electrode and the second electrode and to which a voltage is applied by the first and second electrodes, the improvement comprising: detecting means for detecting the existence of picture signals and producing a detection signal if the picture signals are temporarily interrupted for more than a given period of time; and means for



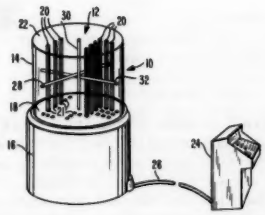
inverting the voltage polarity applied to the liquid crystal held between the first electrode and the second electrode in response to the detection signal.

4,525,711

THREE-DIMENSIONAL FIBER OPTIC DISPLAY

Alan R. Gery, 20 Serpentine La., Old Bethpage, N.Y. 11804

Filed Sep. 3, 1982, Ser. No. 414,986
Int. Cl.³ G09G *3/22, 1/00*
U.S. Cl. 340—815.31 **18 Claims**



1. A three dimensional optical display device, comprising;

a display region having at least one end portion;

a plurality of elongated fiber bundles located within said display region, said bundles being mounted in side-by-side relationship, with each said bundle consisting of a multiplicity of parallel, close-spaced optical fibers, each fiber in a bundle having an inlet tip and an exit tip;

light source means located outside said display region, said bundles extending through said end portion for connection of said fiber inlet tips to said light source means for activation of individual fibers by said light source means; and

control means for energizing said light source means to activate only selected individual fibers, whereby selected fiber exit tips are illuminated to produce a visible light pattern within said display region.

4,525,712

TRANSACTION PROCESSING SYSTEM

Yoshio Okano; Yasuo Okuma; Kuniomi Aizawa, all of Seto; Yasuyoshi Oyama, Owariasahi, and Yoichiro Kitamura, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

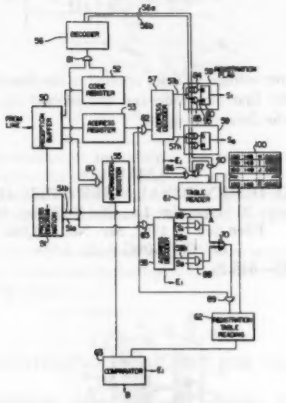
Filed Feb. 18, 1982, Ser. No. 349,856
Claims priority, application Japan, Apr. 24, 1981, 56-61216
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.31 **9 Claims**

1. A transaction processing system comprising a central unit and at least one terminal unit connected to said central unit by a communication line, so that transaction data from said terminal unit may be transmitted together with the address of said terminal unit to said central unit so as to carry out data process-

ing in said central unit in correspondence to said transaction data;

said terminal unit including first means for storing first specific information previously assigned to said terminal unit to authorize said terminal unit to use said central unit, and second means for transmitting to said communication line a transaction request message including said first specific information, said transaction data and said terminal unit address;

said central unit including third means for storing second modifiable specific information and registered in correspondence to each terminal unit which might be connected to said central unit, and fourth means connected to said communication line for conducting data processing to carry out a transaction corresponding to the transaction data included in a received transaction request message only when a predetermined relation is detected between said first specific information included in said received transaction request message and said second specific information read out of said third means on the basis of said terminal unit address included in said received transaction request message, wherein data processing of transaction data from a nonauthorized terminal unit is prevented.



4,525,713

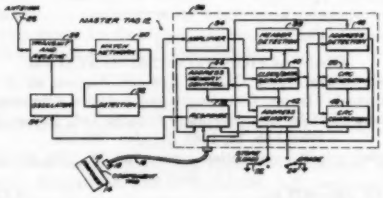
ELECTRONIC TAG IDENTIFICATION SYSTEM

Joseph M. Barletta, Bridgewater, and John P. Yang, Belle Mead, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Mar. 1, 1983, Ser. No. 470,924

Int. Cl.³ H04Q *9/00*; G06K *7/00*

U.S. Cl. 340—825.54 **7 Claims**



1. An electronic component-identification system for use in identifying a plurality of components, said system comprising a plurality of differently coded passive component tags adapted to be respectively secured to said plurality of components, a master tag including a memory, a transceiver for receiving a coded interrogation signal, means for storing the different codes from said plurality of component tags in said memory of said master tag, said master tag further comprising logic means for comparing the codes stored in said memory with the coded interrogation signal received at said master tag from said transceiver and for producing a component-identification signal for each matching code comparison, and means for applying said component-identification signal to said transceiver for transmission to a remote station.

4,525,714

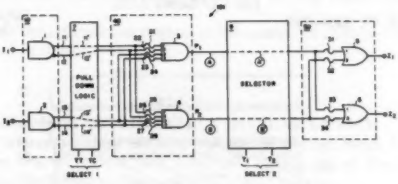
PROGRAMMABLE LOGIC ARRAY WITH TEST CAPABILITY IN THE UNPROGRAMMED STATE

David W. Still, Phoenix, and Peter C. Economopoulos, Scottsdale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 3, 1982, Ser. No. 446,816

Int. Cl.³ H04Q *00/00*

U.S. Cl. 340—825.83 **7 Claims**



1. A programmable circuit array having a plurality of input terminals, each input terminal adapted to receive one of a plurality of input signals, comprising:

(a) input buffer means, having a plurality of output terminals and inverted output terminals, said input buffer means operatively connected to said input terminals, for outputting equivalent input signals and inverted input signals on respective output terminals and inverted output terminals;

(b) programmable product array means, having a plurality of output terminals, operatively connected to said output terminals of said input buffer means thereby receiving said equivalent input signals and said inverted input signals, for generating a plurality of product terms, wherein each output terminal of said programmable product array means transmits one of said product terms;

(c) programmable sum array means for combining said plurality of product terms to generate a plurality of sum terms, each of said plurality of sum terms being an output of said programmable circuit array; and

(d) test means for selectively causing each of said product terms, said equivalent input signals, and said inverted input signals to have a predetermined logic state in response to at least one control signal.

4,525,715

TOROIDAL COUPLED TELEMETRY APPARATUS

Harrison C. Smith, Richardson, Tex., assignor to Tele-Drill, Inc., Richardson, Tex.

Continuation of Ser. No. 324,924, Nov. 25, 1981, abandoned. This application Jan. 18, 1984, Ser. No. 571,644

Int. Cl.³ G01V *1/40*

U.S. Cl. 340—854 **2 Claims**

1. In a downhole toroidal coupled telemetry apparatus for telemetering downhole measurements-while-drilling information from a drill collar of an operating drill string within a wellhole to the surface of the earth by launching electromagnetic signals into the earth bulk and picking up said signals, transmitted through the earth, at the surface of the earth at one

or more locations adjacent to but spaced from the drill string, said toroidal coupled telemetry apparatus comprising:

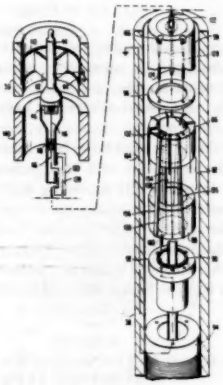
an axially elongated annular core of magnetic-permeability coaxially mounted interiorly within the wall of the drill collar of the drill string;

a plurality of primary electrical conductor windings axially wrapped around the exterior surface of said annular core, said primary electrical conductor windings extending axially around said annular core interiorly within the wall of the drill collar of the drill string;

means positioned within said drill collar for imputing a variable electric current to said primary windings, said current being operable to carry downhole data sensed simultaneously with and during a drilling operation; and

an electrically insulated zone within the sidewall of the drill collar for providing electrical isolation between two areas of the sidewall of the drill collar; wherein the improvement comprises:

secondary electrical conductor winding means at least partially axially wrapped around the exterior surface of said



annular core for receiving variable electrical signals induced by said primary electrical conductor windings and carrying downhole data to be transmitted to the surface of the earth, said secondary electrical conductor winding means comprising one-and-one-half turns of an electrical conductor axially wrapped around the exterior surface of said annular core, said electrical conductor being electrically connected at one end directly to the drill collar on one side of said electrically insulated zone within the sidewall of the drill collar and electrically connected at the other end directly to the drill collar on the other side of said electrically insulated zone remote from said electrically insulated zone such that the drill collar comprises the last one-half turn of a two-turn secondary electrical conductor winding means wherein electrical signals from said secondary electrical conductor means carrying downhole data will be electromagnetically launched into the earth bulk surrounding the drill collar and transmitted to the surface by electromagnetic waves through the earth and picked up at the surface of the earth at one or more locations adjacent to but spaced from the drill string.

4,525,716

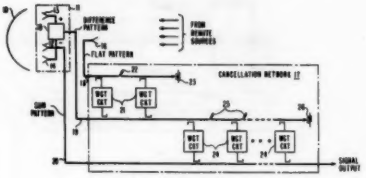
TECHNIQUE FOR CANCELLING ANTENNA SIDELOBES

James W. Carlin, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 10, 1984, Ser. No. 648,814

Int. Cl.[3] **G01S** *3/16, 3/28*

U.S. Cl. 343—381 **5 Claims**



1. An antenna sidelobe cancellation arrangement comprising:

a first input for receiving a sum pattern signal from an antenna monopulse feed;

a second input for receiving a difference pattern signal from the antenna monopulse feed;

a third input for receiving a flat pattern signal from a standard gain omnidirectional antenna feed; and

a cancellation network comprising:

a first canceller section coupled to the second and third inputs for appropriately shifting the difference pattern signal from the second input by a predetermined amount with the flat pattern signal from the third input to generate an output signal wherein the lobes of the shifted difference pattern signal correspond to the lobes of the sum pattern signal at the first input; and

a second canceller section responsive to the output signal from the first canceller section and the sum signal at the first input for introducing appropriate portion of the shifted difference pattern signal into the sum pattern signal for substantially cancelling interference in the sum pattern signal at an output of the cancellation arrangement.

4,525,717

POSITION DISPLAY INSTRUMENT

Eberhard Wildermuth, Leinfelden-Echterdingen; Dirk Jansen, Ueberlingen/Bodensee; Rudolf Burkhardt, Stuttgart, and Joachim Merz, Esslingen-Mettingen, all of Fed. Rep. of Germany, assignors to Universität Stuttgart, Institut Für Flugnavigation, Stuttgart, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,953

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031258

Int. Cl.[3] **G01C** *21/20;* **G01S** *5/02*

U.S. Cl. 343—452 **4 Claims**

1. In a position display instrument for light spot display on a map of the position of vehicles, in particular aircraft or helicopters, comprising

a flat map holder for accommodating and holding map sheets in an exact position,

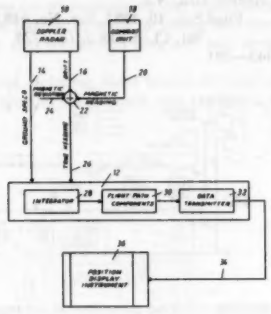
a light transmitter located below the map holder for producing a light spot on the map sheet and movable in two coordinates by positioning means,

a microcomputer, to which the grid coordinates of the vehicle position are applied from a navigational computer and by which the positioning means are controlled,

a memory for storing map data, said memory cooperating with the microcomputer, and

display means connected to the microcomputer and by which the map sheet or map field required for the respective grid coordinates is displayed, the improvement comprising:

(a) the microcomputer comprises means for forming



$$x' = \frac{x - x_M}{M} + a$$

$$y' = \frac{y - y_M}{M} + b,$$

wherein

x,y are the grid coordinates of the vehicle position as provided by the navigational computer,

x_M,y_M are the coordinates of the map center as provided by the memory,

M is the map scale and

a,b are the half the height and width dimensions, respectively, of the map sheet or map field,

(b) the light transmitter (**122**) is arranged by means of the positioning means (**100,102,114,116**), to automatically be positioned at the coordinates thus determined with respect to one map corner,

(c) means are provided for supplying an edge signal to the microcomputer when the light transmitter (**122**) reaches the edge of the map sheet or map field, and

(d) the microcomputer, when receiving the edge signal,

(d_1) forms x' and y' consecutively for the various map data x_M,y_M stored in the memory,

(d_2) tests, each time, for the condition

$$0 \leqq x' < 2a$$

$$0 \leqq y' < 2b$$

and,

(d_3) when this condition is met

(d_{31}) discontinues further testing,

(d_{32}) supplies the identification of the associated new map sheet for display to the display means, and

(d_{33}) controls the positioning means to move the light transmitter (**122**) into the position

$$x' = \frac{x - x_{M1}}{M} + a$$

$$y' = \frac{y - y_{M1}}{M} + b \text{ and,}$$

(d_4) when this condition is not met with any of the stored pairs x_M,y_M, provides a nil return.

4,525,718

ANTENNA WITH COAXIAL CONNECTOR

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,895

Int. Cl.³ H01Q *1/50*

U.S. Cl. 343—702 **8 Claims**

1. An antenna comprising: an antenna body telescopically extendable from a fully retracted position and having a free end; an electrode member mounted to the free end of said antenna body, said electrode member having a tubular, electrically conductive portion electrically coupled to the antenna body and defining an axial bore; base means for mounting said antenna body to a radio, said base means including a casing member for telescopically mounting said antenna body and a receptacle portion for coaxially receiving said electrode member when the antenna body is in said fully retracted position; said electrode member and said receptacle portion of said base means together forming a coaxial connector receptacle when said antenna body is in said fully retracted position.

4,525,719

DUAL-BAND ANTENNA SYSTEM OF A BEAM WAVEGUIDE TYPE

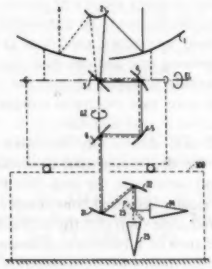
Ikuro Sato, and Ryuichi Iwata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,614

Claims priority, application Japan, Jul. 12, 1982, 57-120927

Int. Cl.³ H01Q *19/19*

U.S. Cl. 343—761 **8 Claims**



2. A dual-band, beam wave-guide type antenna system comprising a dual reflector antenna having a main reflector and a subreflector and being rotatable about elevation and azimuth axes, first and second feed horns for radiating first and second

electromagnetic waves of first and second frequencies, respectively, and beam wave-guide means for coupling said first and second electromagnetic waves from said first and second horn means to said subreflector, said beam wave-guide means comprising:

frequency selective reflector means for receiving said first electromagnetic wave from said first feed horn and reflecting said first electromagnetic wave substantially along a first path, and for receiving said second electromagnetic wave from said second feed horn and passing said second electromagnetic wave substantially along said first path;

a first reflector for receiving electromagnetic waves along said first path from said frequency selective reflector means and for reflecting said electromagnetic waves along a second path; and

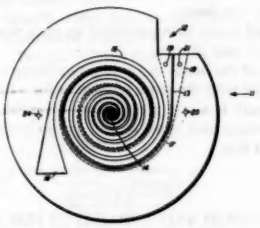
a second reflector for receiving electromagnetic waves along said second path from said first reflector and for reflecting said electromagnetic waves along a third path substantially coincident with said azimuth axis.

4,525,720

INTEGRATED SPIRAL ANTENNA AND PRINTED CIRCUIT BALUN

Robert G. Corzine, and Joseph A. Mosko, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,651
Int. Cl.³ H01Q *1/36*
U.S. Cl. 343—895 **19 Claims**



1. A broadband antenna, comprising:

a first planar dielectric substrate having first and second surfaces;

a spiral conductor formed on said first surface of said first planar dielectric substrate, said conductor originating at an input balun on the outer periphery of said spiral conductor and spiraling inwardly to a center termination;

a first spiral radiator formed on said first surface of said first planar dielectric substrate, said first spiral radiator originating at and coupled to said center termination of said spiral conductor and thereafter spiraling outwardly equidistant between successive rings of said spiral conductor and terminating on the outer periphery of said first spiral radiator at a first balance pad, said first radiator increasing in width along the spiral from said center termination to said balance pad; and

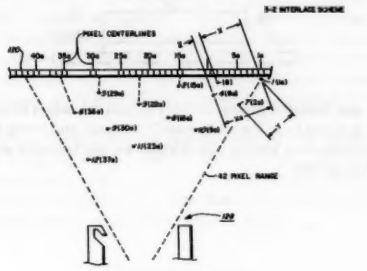
a second spiral radiator formed on said second surface of said first planar dielectric substrate, said second radiator originating at a second balance pad on the outer periphery of said second spiral radiator and spiraling inwardly to a center termination, said second radiator decreasing in width in a balancing manner with said first radiator spiral along the spiral from said second balance pad to said center termination and being coextensive with said spiral conductor forming a first ground plane.

4,525,721

INK JET INTERLACE STRATEGY

Peter A. Crean, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1983, Ser. No. 471,411
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **4 Claims**



1. An improved process for controlling the trajectories of ink droplets from a plurality of nozzles of an ink jet printing device of the type having a droplet generator with multiple nozzles for generating streams of droplets, a charging electrode for each nozzle operated by a controller for inducing a charge of either polarity on each droplet as they pass thereby and a means for producing an electric field for deflecting the charged droplets to specific pixel locations on a recording medium according to the induced charge placed thereon by the charging electrodes or to an ink recovering gutter depending upon a print or no print charging decision by the controller, the improved process comprising: charging of said droplets by its associated charging electrode according to a multiple level interlace scheme such that sequentially generated droplets are directed serially to one pixel in each of a predetermined number of groupings of equal pixel locations that make up the total number of linear, adjacent pixel locations which are assigned to each particular nozzle, said interlace scheme assuring that succeeding droplets are directed to predetermined pixels located in groupings always separated by a distance equal to at least two pixel groupings, the multiple level interlace scheme being accomplished by multiple scanning of the total number of pixel groupings for print or no print decisions of said predetermined pixel location in each of said pixel groupings prior to repeating the multiple scanning for subsequent print or no print decisions for a succeeding pixel location in each of said pixel grouping, said multiple scanning of the total number of pixel groupings being continued until each pixel location in each group has been addressed and a droplet produced therefor which will be directed to the recording medium or to the gutter depending upon instructions from the controller, so that droplets directed to contiguous pixels are separated by the distance equivalent to the in-flight spacing between a number of sequentially generated droplets equal to the number of pixel groups and so that adjacent, sequentially generated droplets are separated prior to their impact with the recording medium by a distance equal to at least two pixel groups.

4,525,722

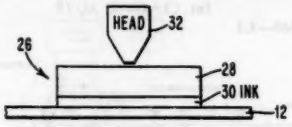
CHEMICAL HEAT AMPLIFICATION IN THERMAL TRANSFER PRINTING

Krishna G. Sachdev; Harbans S. Sachdev, both of Wappingers Falls; Ari Aviram, Yorktown Heights, and Mark A. Wizner, Beacon, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1984, Ser. No. 582,694
Int. Cl.³ B41J *31/02*; G01D *15/10*
U.S. Cl. 346—1.1 **22 Claims**

1. In thermal transfer printing an ink bearing ribbon compris-

ing a support layer and at least one other layer, said one other layer including a fusible ink which is solid at room temperature and which includes a low melting point polymer binder and a suitable colorant, and an exothermic heat amplification material, said material giving off heat to said ink when its temperature is raised to at least a threshold amount, and being a hydrazone derivative having a molecular weight between about 150 and about 650.

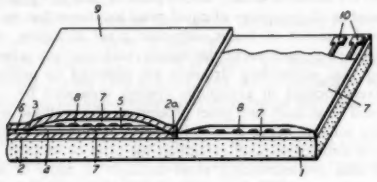


4,525,723

MAGNETIC RECORDING HEAD

Nobuo Nishimura; Teruhiko Itami; Toshifumi Kimoto; Shunsuke Tomiyama, and Koichi Saitoh, all of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1982, Ser. No. 449,940
Claims priority, application Japan, Dec. 25, 1981, 56-209114
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.4 **4 Claims**



1. A magnetic recording head for producing latent magnetic images in a moving magnetic recording medium comprising:

an elongated, thin film magnetic head core having a gap therein, the magnetic head core being disposed substantially perpendicular to the moving direction of the magnetic recording medium and in contact therewith so that the gap is adjacent the magnetic recording medium;

a thin film electrical conductor coiled about said magnetic head core for exciting the magnetic head core to produce a magnetic flux therein;

a heat generation body disposed in said gap of said magnetic head core and having the same length as said magnetic head core;

a wiring layer positioned within said magnetic head core, the layer having a series of electrically conducting wires connected to said heat generation body and adapted for selectively applying a print signal voltage to a segment of the heat generation body between any two wires connected thereto; and

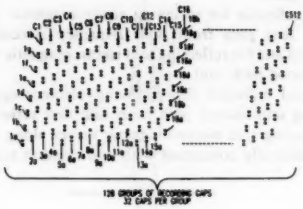
a high magnetic permeable body having a relatively low magnetic curie point and disposed within the gap of the magnetic head core and in contact with the heat generation body and the moving recording medium.

4,525,724

MAGNETIC RECORDING HEAD ARRAY FOR LONGITUDINAL MAGNETIC PRINTING WITH STAGGERED HEAD ARRANGEMENT AND CLUSTERED WIRING

Peter A. Franaszek, Katonah, and Edward J. Yarmchuk, Purdys, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 394,016
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.5 **13 Claims**



1. In an arrangement of a plurality of magnetic heads formed in a staggered array,

including an x axis directed transversely,

a y axis directed vertically,

said heads including gaps therein,

said heads being formed in a plurality of groups of parallel columns with said gaps in said heads in adjacent columns being aligned in a periodically staggered arrangement with a word line being coupled to all heads along a transverse line basis,

a pair of heads being coupled to each word line in a given one of said groups,

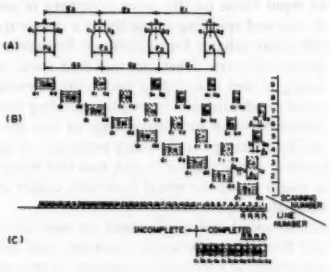
and all of the heads in a said group being coupled to a single bit line with the sense of current for a first one of said pair of heads in a said group being reversed in said bit line for the other said head in said group coupled to said same word line.

4,525,725

METHOD AND APPARATUS FOR FORMING MAGNETIC LATENT IMAGES

Kunio Kinoshita, Hachioji, and Norio Kokaji, Hino, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,511
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.5 **2 Claims**



1. A method for forming latent images in a magnetic printing apparatus, which comprises scanning a magnetic recording medium by a recording head having first, second, . . . and m-th channels (m is an integer of $m \geqq 3$), wherein at a first magnetic latent image recording scanning, first, second, . . . and m-th

channels of the recording head form magnetic latent images on the (mn−m+1)-th line (n is a positive integer indicating the scanning frequency of the recording head), the (mn−m+2)-th line, . . . and the (mn)-th line, respectively, and loci of the subsequent channels are overlapped on parts of loci of the preceding channels; at a second magnetic latent image recording scanning, first, second, . . . and m-th channels of the recording head form magnetic latent images on the (mn)-th line, the (mn−1)-th line, . . . and (mn−m+1)-th line, respectively, loci of the subsequent channels are overlapped on parts of loci of the preceding channels; and the track pitches of the first, second, . . . and m-th channels of the recording head satisfy the requirement of the following formula (1):

$$E_1=(am+1)\times P_1 \quad (1)$$

wherein E_1 stands for the track-pitch, a is an optional integer, m stands for the number of channels and P_1 stands for a first latent image scanning line width, at the first magnetic latent image recording scanning and also satisfy the requirement of the following formula (2):

$$E_2=(am-1)\times P_2 \quad (2)$$

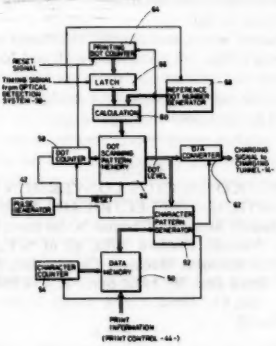
wherein E_2 stands for the track pitch, which is nearly equal to the track pitch E_1, and P_2 stands for a second latent image scanning line width, at the second magnetic latent image recording scanning.

4,525,726

INTERPOLATION DOT CONTROL IN AN INK JET SYSTEM PRINTER

Yuichirou Mori, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1983, Ser. No. 462,700
Claims priority, application Japan, Feb. 10, 1982, 57-20322
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. An ink jet system printer of the charge amplitude controlling type comprising:

means for emitting printing ink droplets, said printing ink droplets including primary matrix dots and interpolation ink droplets not assigned to primary dots and being developed between adjacent primary matrix dots;

a record receiving member disposed in front of said printer head and selectively receiving said primary matrix dots, said interpolation ink droplets not being applied to said record receiving member;

shift means for shifting said means for emitting printing ink droplets in the lateral direction with respect to said record receiving member;

detection means for developing a timing signal each time said means for emitting printing ink droplets travels a predetermined length in said lateral direction;

counter means for counting said printing ink droplets emitted from said means for emitting printing ink droplets between adjacent timing signals developed from said detection means;

reference number generation means for developing a reference dot number representative of a reference number of droplets between adjacent timing signals in response to said timing signal developed from said detection means;

comparing means for comparing the count number counted by said counter means with said reference dot number developed from said reference number generation means; and

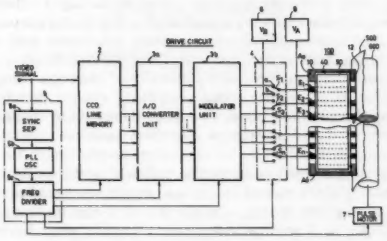
print control means for varying the ratio of said interpolation ink droplets with respect to said primary matrix dots in response to a comparison result developed from said comparing means so as to maintain the density of said primary matrix dots substantially constant.

4,525,727

ELECTROOSMOTIC INK PRINTER

Tadao Kohashi, Moriguchi; Hiroyuki Irie, Osaka; Susumu Ide, Katano, and Hiroshi Esaki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Feb. 16, 1983, Ser. No. 467,355
Claims priority, application Japan, Feb. 17, 1982, 57-24729; Jun. 7, 1982, 57-97934
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **20 Claims**



1. A method of operating an electroosmotic ink printer head including an array of recording electrodes successively arranged to define a print line along one edge of said head, an overlying electrode means in spaced overlying relationship with the recording electrodes and means provided between said electrode array and said overlying electrode means for electroosmotically moving ink in a direction toward said print line and in an opposite direction depending on an electrical potential applied to said recording electrodes with respect to the overlying electrode means, said method comprising the steps of:

(a) storing a video input signal in a plurality of storage locations corresponding to said recording electrodes; and

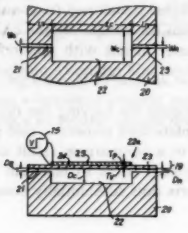
(b) disabling a first group of said recording electrodes by applying thereto a first potential to cause said ink to move in the opposite direction while enabling a second group of said recording electrodes by applying thereto a second potential to cause said ink to move toward said print line as a function of the stored signals for said second group of recording electrodes, and subsequently disabling said second group while enabling said first group, the electrodes of each group being located alternatively with those of the other.

4,525,728

INK JET RECORDING HEAD

Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,580
Claims priority, application Japan, Apr. 27, 1982, 57-70958
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **8 Claims**



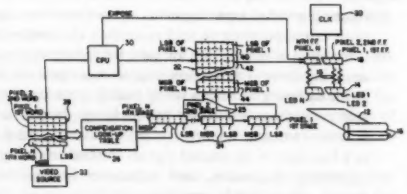
1. An on-demand type ink jet recording head comprising a substrate, a plurality of pressurization chambers of substantially rectangular configuration disposed in adjacent relationship on said substrate, each said pressurization chamber having an inlet and an outlet, each said pressurization chamber having an ink supply passage in fluid communication with the respective inlet thereof for supplying ink to said pressurization chambers, each said pressurization chamber having a nozzle with a first end in fluid communication with the respective outlet thereof and a second end through which ink droplets are ejected, said nozzles extending in a substantially straight line from said respective pressurization chamber associated therewith, each said pressurization chamber having a vibratory plate which forms at least a portion of a wall of said pressurization chambers, a piezoelectric element associated with each said pressurization chamber and coupled respectively to the vibratory plate thereof, said piezoelectric elements being responsive to an electric signal selectively applied thereto for flexing the vibratory plates associated therewith to change the volume of the pressurization chambers associated therewith, said nozzles each having an equivalent nozzle length Ln of 1 mm or less defined between the outlet of said pressurization chamber and the second end of said nozzle, each said pressurization chamber having a width Wc of 1 mm or less and a length Lc of 1 mm or more, said vibratory plate having a thickness Tv of 200 μm or less and said piezoelectric elements having a thickness Tp of 200 μm or less.

4,525,729

PARALLEL LED EXPOSURE CONTROL SYSTEM

Martin A. Agulnek, Sharon; Joseph M. Canter, and Michael L. Reisch, both of Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1983, Ser. No. 481,830
Int. Cl.³ G01D *15/14;* **H04N** *1/30*
U.S. Cl. 346—154 **14 Claims**



1. Apparatus for recording on a photosensitive medium an image defined by electronic signal information in binary word format comprising:

an array of spaced apart discrete light sources each corresponding to a different pixel of the image to be recorded on the photosensitive medium; and

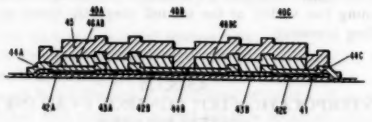
means for simultaneously controlling the energization of all of said discrete light sources at a substantially constant energy level in a series of intervals wherein each interval is timed differently to correspond to a different one of the data bits in the binary words which comprise the image defining electronic signal information and each said light source is energized during each said interval as a function of the state of the data bit corresponding to that interval for that light source.

4,525,730

BURIED JUNCTION JOSEPHSON INTERFEROMETER

Johannes G. Beha, Wadenswil; Heinz Jaeckel, Kilchberg, and Peter Vettiger, Langnau A. Albis, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,331
Int. Cl.³ H01L *39/22, 27/12, 45/00, 45/02*
U.S. Cl. 357—5 **6 Claims**



1. A buried junction Josephson interferometer comprising a base electrode, covered in junction areas with a plurality of tunnel barrier layers forming Josephson junctions, a plurality of counter-electrodes deposited over said tunnel barrier layers, an interferometer bridge connecting said counter-electrodes, separated from said base electrode by insulating layers,

characterized in that

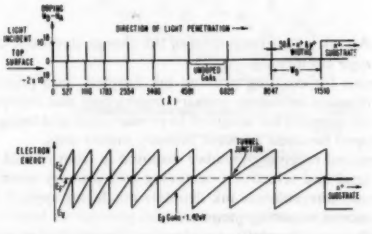
said insulation layers, said counter-electrodes and said interferometer bridge are juxtaposed with said Josephson junctions and said counter-electrodes are located substantially underneath said interferometer bridge but substantially isolated by said insulation layer.

4,525,731

SEMICONDUCTOR CONVERSION OF OPTICAL-TO-ELECTRICAL ENERGY

Terry I. Chappell, Amawalk; Thomas N. Jackson, Ossining, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,784
Int. Cl.³ H01L *27/14, 29/88, 31/06*
U.S. Cl. 357—12 **9 Claims**



1. In a semiconductor optical-to-electrical energy converter of the type having a plurality of serially connected semicon-

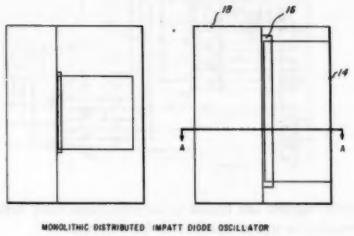
ductor regions joined by quantum mechanical tunneling junctions, the improvement comprising each region being undoped and having a thickness dimension of the order of ballistic transport and each tunneling junction being of the order of the mean free path of a carrier in the semiconductor material of said tunneling junctions.

4,525,732

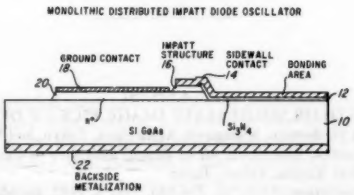
DISTRIBUTED IMPATT STRUCTURE

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas City, Tex.

Filed Aug. 31, 1983, Ser. No. 528,210
Int. Cl.³ H01P *1/15, 3/08;* **H01L** *29/90, 27/13*
U.S. Cl. 357—13 **6 Claims**



MONOLITHIC DISTRIBUTED IMPATT DIODE OSCILLATOR



1. A microwave device comprising: A semiconductor diode active region interposed between frontside and backside contacts, said semiconductor active region defining a negative resistance diode between said frontside and backside contacts;

said semiconductor active region and said frontside and backside contacts being elongated in a front direction;

said frontside contact being extended beyond said active region in a direction normal to said first direction, to form a transmission line having a principal direction of propagation substantially parallel to said first direction.

4,525,733

PATTERNING METHOD FOR REDUCING HILLOCK DENSITY IN THIN METAL FILMS AND A STRUCTURE PRODUCED THEREBY

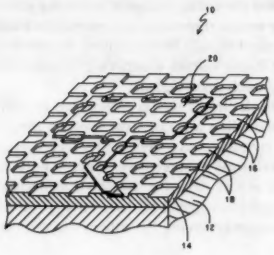
David L. Losee, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,422
Int. Cl.³ H01L *21/285*
U.S. Cl. 357—65 **8 Claims**

1. A method of reducing hillock density in a thin film of metal having a high coefficient of thermal expansion on a substrate having a low coefficient of thermal expansion, comprising the steps of:

forming for the purpose of reducing hillocks, a bas-relief pattern of lands and valleys, in an area of the substrate normally free from such pattern;

forming on said pattern a thin film of metal having a high coefficient of thermal expansion, the height and depth dimensions of said lands and valleys being of the same order of magnitude as the thickness of said metal film,



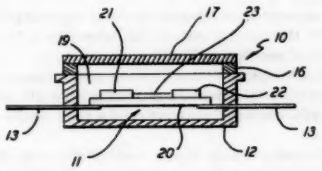
whereby stress relief is provided by said bas-relief pattern thereby reducing hillock formation in said metal film.

4,525,734

HYDROGEN CHARGED THIN FILM CONDUCTOR

James A. Schwarz, Fayetteville, and Robert W. Pasco, Syracuse, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,503
Int. Cl.³ H01L *23/36, 23/48*
U.S. Cl. 357—67 **3 Claims**



1. A conductive thin film stripe that has high resistance to electromigration, at operating temperatures in excess of 100° C., said stripe comprising aluminum alloyed with at least one other element that forms a chemical bond with both aluminum and hydrogen, said at least one other element being selected from the group consisting of Group III-B, Group IV-B, Group VI-B, Group VIII and rare earth elements in the periodic table, and a compound containing hydrogen and said at least one other element that is stable at temperatures in excess of 100° C. whereby hydrogen is retained within the stripe at these elevated temperatures.

4,525,735

SYSTEM FOR MEASURING AND IDENTIFYING LINE SPACING ON A CURVED SURFACE

Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 15, 1983, Ser. No. 466,595
Int. Cl.³ H04N *9/62*
U.S. Cl. 358—10 **15 Claims**

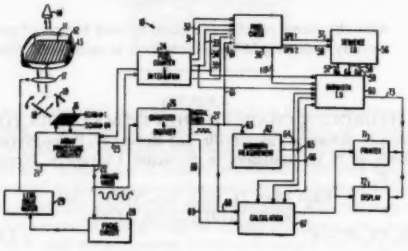
1. A system for measuring matrix barwidths wherein each barwidth includes an opaque line and a transparent space, said barwidths being grouped into sets of barwidths with the corresponding barwidth of each set being sequentially identified, said system having an array of energy responsive pixels, each of said pixels providing an analog pixel signal one level when energy is received from one of said lines, and another level when energy is received from one of said spaces whereby said array provides an analog video signal varying between said

levels in accordance with said lines and spaces, said system comprising:

quantizer circuit means for receiving said analog video signal and providing a digital video signal;

counter means responsive to a particular transition of each of said pixel signals for providing a pixel count output, said pixel count output identifying which of said pixels provided each pixel signal;

pixel check circuit means responsive to said counter means for providing at least two selected pixel signals from at least two selected pixels, said selected pixels being spaced on said array whereby the spacing between said selected pixels is less than the width of said space, both of said selected pixel signals initially having one of said levels and subsequently having the other of said levels and returning



to said one level when both of said selected pixels transfer from the space of one of said barwidths to the line of the next of said bar widths;

barwidth sequential identification means responsive to said selected pixel signals for providing barwidth identification signals when said selected pixel signals return to said one level;

measurement circuit means responsive to said digital video signal for sequentially providing width signals representative of the widths of said barwidths;

barwidth identification means responsive to said width signals and to said barwidth identification signals for providing the sequential identification of said barwidths; and

calculation circuit means responsive to said digital video signal and to width signals for providing calculated barwidth signals and calculated space width signals.

4,525,736

SELECTIVE COLOR MODIFICATION

Nathaniel I. Korman, Princeton, N.J., assignor to Ventures Research & Development Group, Albuquerque, N. Mex.

Filed Sep. 13, 1982, Ser. No. 417,345

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—28 **14 Claims**

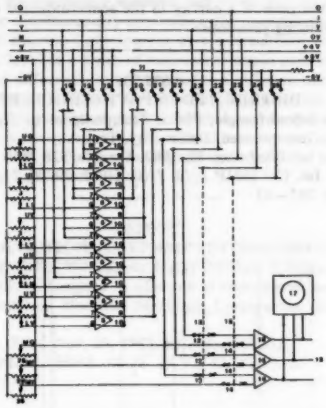
1. A color modification system for color television pictures, said pictures being represented by three color signals corresponding, respectively, to the three attributes of a color, wherein there are:

means for controlling three modification amounts, one for each of the three color signals,

means for controlling upper and lower boundaries for each of the three color signals,

means for finding when the three color signals simultaneously lie within their respective upper and lower boundaries, and

means for adding the three modification amounts to each of the three color signals, respectively, only when the three



color signals are found to lie simultaneously within their respective upper and lower boundaries.

4,525,737

COLOR SOLID STATE IMAGE PICK-UP DEVICE

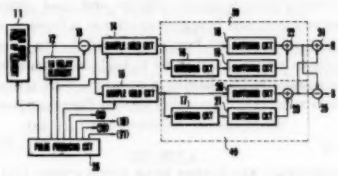
Seiji Hashimoto, Kanagawa; Akira Suga, Tokyo, and Nobuyoshi Tanaka, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,883, May 4, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 629,747

Claims priority, application Japan, May 11, 1981, 56-69377; May 11, 1981, 56-69378

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **17 Claims**



1. A color solid state image pick-up device comprising:

(a) a solid state image pick-up arrangement including a plurality of picture elements with photoelectric sensitivities, said picture elements forming rows and columns;

(b) a filter arrangement including plural kinds of color filters each corresponding to the picture element, said plural kinds of color filters having a predetermined repeating pattern in the column and row directions;

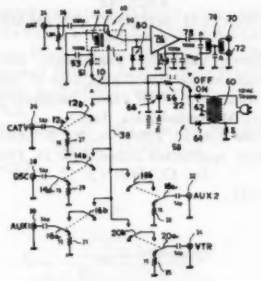
(c) correlation process means for obtaining correlative color outputs from a plurality of rows of signals;

(d) inversion control means for inverting the correlative color outputs of the correlative process means at a predetermined period corresponding to the row directional repeating pattern of said color filters for the picture elements.

4,525,738
AMPLIFIED VIDEO SIGNAL DISTRIBUTING APPARATUS

Kazuyoshi Imazeki, and Hasashi Wani, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,500
Int. Cl.³ H04N 5/22
U.S. Cl. 358—181 **6 Claims**

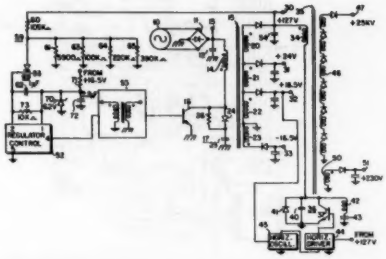


1. An amplified video signal distributing apparatus comprising: a primary input terminal; a plurality of secondary input terminals, means for selecting an input signal appearing at one of said secondary input terminals; at least one output terminal; control signal generating means for generating a primary control signal and a secondary control signal; controllable switchable means responsive to said primary control signal for coupling said primary input terminal to at least one of said output terminals and responsive to said secondary control signal for coupling the input signal selected by said selecting means to said at least one output terminal; wherein said controllable switching means comprises a relay having a first contact coupled to said primary input terminal and a second contact coupled to said selecting means, a movable contactor for coupling one of said first and second contacts in circuit with said at least one output terminal, relay coil means and coil energizing means, said coil means being operative for placing said movable contactor in electrical contact with said first contact when energized and for placing said movable contactor in electrical circuit with said second contact when de-energized; said control signal generating means comprising a switch coupled between said relay coil means and said coil energizing means for selectively energizing and de-energizing said relay coil means; and wherein said selecting means comprises a plurality of switching elements respectively coupled intermediate said plurality of secondary input terminals and said second relay contact for selectively coupling the input signal from any one of said secondary input terminals to said second relay contact; and further including a line terminating impedance element associated with each of said plurality of secondary input terminals; and wherein said plurality of switching elements are mechanically interconnected for coupling only one of said plurality of secondary input terminals to said second relay contact at a time and for coupling each of the remaining ones of said plurality of secondary input terminals to the associated line-terminating impedance element.

4,525,739
TELEVISION RECEIVER POWER SUPPLY REGULATION RESPONDING TO BEAM CURRENT CHANGES

William V. Fitzgerald, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 451,904, Dec. 21, 1982, abandoned. This application Mar. 30, 1983, Ser. No. 480,514
Int. Cl.³ H04N 3/18
U.S. Cl. 358—190 **12 Claims**



1. A television receiver incorporating means for providing a plurality of load circuit voltage supplies including means for deriving a high voltage level from one of said load circuit voltage supplies, said high voltage level subject to reduction in response to a receiver operating characteristic, said receiver operating characteristic also loading said one of said load circuit voltage supplies, therefore producing an ac ripple component in the voltage level of said one of said load circuit voltage supplies, said receiver comprising:

a deflection circuit energized by said one of said load circuit voltage supplies for providing an electron beam deflection current, the level of said current determined by the average dc level of the voltage of said one of said load circuit voltage supplies;

control means responsive to a voltage level for controlling the operation of said voltage supply providing means in order to maintain the voltage levels of said voltage supplies substantially constant; and

means coupling said one of said load circuit voltage supplies to said control means comprising detector means for providing a voltage level to said control means representative of the peak level of the voltage of said one of said load circuit voltage supplies, such that said average dc level of the voltage of said one of said load circuit voltage supplies decreases in response to the presence of said ac ripple component to compensate said electron beam deflection current for said reduction in said high voltage level.

4,525,740
TV RECEIVER WITH MULTIPLEXED MICROPROCESSOR KEYBOARD SCANNING AND CHANNEL NUMBER DISPLAY

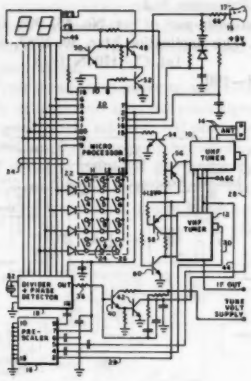
Arthur N. Borg, Lake Forest, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 24, 1982, Ser. No. 381,110
Int. Cl.³ H04N 5/44, 5/50
U.S. Cl. 358—192.1 **13 Claims**

1. In a television receiver including a keyboard for entering a selected number, a channel number display for presenting a selected channel number, and a video display wherein a video image is generated by the repetitive sequential vertical and horizontal sweep of an electron beam on said video display wherein the vertical sweep of said electron beam is initiated by a vertical pulse occurring within a vertical retrace interval during which said video display is blanked, a method for detecting and displaying a selected channel number comprising:

detecting a vertical pulse;

scanning said keyboard in response to the occurrence of said vertical pulse during said vertical retrace interval for detecting a selected channel number thereon; and



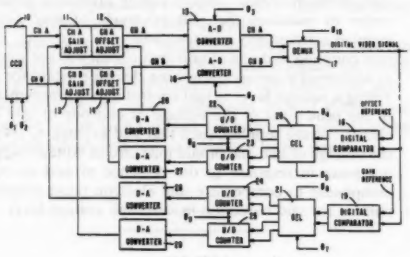
providing said selected channel number detected by the scanning of said keyboard to said channel number display for presenting said selected channel number thereon during the electron beam sweep of said video display.

4,525,741

SELF-ADJUSTING VIDEO CAMERA

Maninderpal S. Chahal, Kitchener, and Roger H. Therrien, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 3, 1982, Ser. No. 438,826
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—212 **18 Claims**



1. A solid state imaging apparatus for receiving a plurality of input analog signals having individual white and black references and generating corresponding digital output signals having gain and offset values equivalent to a preselected gain reference and offset reference, respectively, said apparatus comprising:

a plurality of gain adjust means each receptive of one of said input signals and responsive to a gain adjust signal for adjusting the gain of said signals to said preselected gain reference;

a plurality of offset adjust means each connected to one of said gain adjust means and responsive to an offset adjust signal for adjusting the offset of said signals to said preselected offset reference;

a plurality of analog-to-digital converter means each coupled to said offset adjust means for digitizing said signal;

demultiplexer means coupled to said plurality of analog-to-digital converter means for merging said plurality of digitized signals and generating said digital output signals;

a plurality of gain adjustment feedback loops, one corresponding to each of said input signals, connected between said demultiplexer means and one of said gain adjust means for generating said gain adjust signals; and

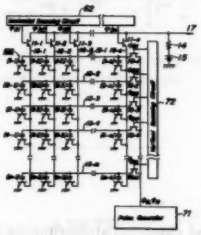
a plurality of offset adjustment feedback loops, one corresponding to each of said input signals, connected between said demultiplexer means and one of said offset adjust means for generating said offset adjust signal.

4,525,742

TWO-DIMENSIONAL SOLID-STATE IMAGE SENSOR DEVICE

Junichi Nishizawa; Takashige Tamamushi, both of Sendai; Fumihiko Ando; Shigeo Yoshikawa, both of Tokyo, and Koji Shimanuki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co. Ltd., Minamiashigara, Japan

Filed Feb. 13, 1984, Ser. No. 579,643
Claims priority, application Japan, Feb. 14, 1983, 58-21688
Int. Cl.³ H01N *3/12*
U.S. Cl. 358—213 **4 Claims**



1. A two-dimensional solid-state image sensor device, comprising:

(a) a plurality of picture cells which are two-dimensionalally arranged in column and row directions;

each picture cell comprising:

(a-1) a static induction transistor having first and second main electrode regions formed of semiconductor regions with one conductivity type which are disposed on opposite sides of a high resistance semiconductor channel region, and a gate region formed of a semiconductor region with the other conductivity type which is adjacent to said channel region to control a current flowing between said first and second main electrode regions, and

(a-2) a transparent electrode disposed via a capacitance on at least a portion of said gate region, in a manner that light is incident through said transparent electrode to said gate region in which the carrier produced by the light excitation is stored to control said current;

(b) a plurality of selection lines, each of which connects the gate regions of said picture cells in each column in common via the capacitances;

(c) means for sequentially selecting said plurality of selection lines;

(d) means for applying a readout pulse voltage to the selected selection lines during one horizontal scanning period and for applying a refresh pulse voltage which is larger than said readout pulse voltage during one horizontal blanking period subsequent to said horizontal scanning period;

(e) a plurality of signal readout lines, each of which connects the first main electrode regions of said picture cells in each row in common;

(f) means for sequentially selecting said plurality of signal readout lines during one horizontal scanning period; and

(g) means for applying a readout pulse to said first main

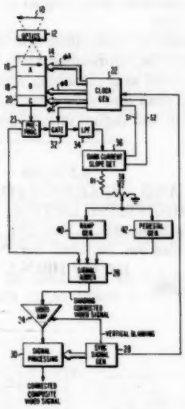
electrode regions to obtain a video signal stored in the picture cell selected by the selected selection line.

4,525,743

DARK CURRENT MEASUREMENT AND CONTROL FOR CAMERAS HAVING FIELD-TRANSFER CCD IMAGERS

Robert F. Wood, Jr., Lansdowne Borough, Pa.; John F. Monahan, Marlton, and Peter A. Levine, West Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1984, Ser. No. 594,400
Int. Cl.³ H04N *5/16*
U.S. Cl. 358—213 **21 Claims**



1. In a television camera including a solid-state imager of the field-transfer type having a first area responsive to scene radiation for developing fields of video samples descriptive of said scene and a second area substantially blocked from said scene radiation for supplying at an output said fields of video samples one line at a time in raster scan order, means for determining the amount of dark current integrated in said second area, comprising:

clock means for supplying clocking signals to said first and second areas for establishing recurrent first intervals during which present fields of video samples descriptive of said scene radiation are developed in said first area while prior developed fields of video samples are line sequentially supplied from the output of said second area, and for establishing recurrent second intervals during which said present fields of video samples are transferred from said first area to said second area and during which remnant signal is supplied at the output of said second area, said remnant signal including a variable pedestal portion and a ramp-like portion representative of dark current integrated in said second area during said recurrent first intervals; and

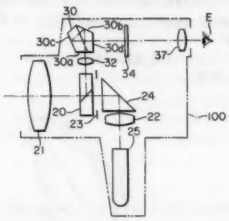
slope responsive means coupled to receive said remnant signal for generating an indication signal having a level responsive to the slope of said ramp-like portion of said remnant signal and substantially unresponsive to the variable pedestal portion of said remnant signal.

4,525,744

VIEWFINDER OPTICAL ARRANGEMENT OF A CAMERA

Soichi Nakamura, Kamakura, and Kunio Konno, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 416,090
Claims priority, application Japan, Sep. 18, 1981, 56-146083
Int. Cl.³ H04N *9/04;* **G03B** *19/14*
U.S. Cl. 358—224 **8 Claims**



1. An optical arrangement of a camera comprising:

(a) a picture-taking lens system;

(b) a beam splitter for extracting a light beam from light passing through said picture-taking lens system; and

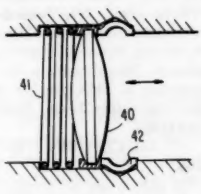
(c) a viewfinder optical system for directing said light beam to a viewfinder eyepiece, said optical system including focus screen means, a master lens for imaging said light beam on said focus screen means, pentaroof prism means disposed between said master lens and said focus screen means for forming an erect image to be viewed, and an eyepiece for observing therethrough an image on said focus screen means, said pentaroof prism means having an entrance surface opposed to said master lens, an exit surface substantially orthogonal to said entrance surface, a first reflecting surface for reflecting the light beam from said entrance surface, and a second reflecting surface for reflecting the light beam from said first reflecting surface toward said exit surface, said second reflecting surface being formed by a roof surface comprising two flat surfaces intersecting each other.

4,525,745

TEMPERATURE COMPENSATION FOR TV PROJECTION LENS AND CRT ASSEMBLY

Sanjar Ghaem-Maghami, and Raymond G. Ehlers, both of Chesapeake, Va., assignors to General Electric Company, Portsmouth, Va.

Filed Oct. 22, 1982, Ser. No. 435,838
Int. Cl.³ H04N *5/74;* **G02B** *7/02*
U.S. Cl. 358—237 **10 Claims**



1. In a projection TV system of the type comprising at least one lens and CRT assembly arranged to project an image onto a screen for viewing, the focus of said lens varying with ambient temperature around the lens as the temperature increases from turn-on of the projection TV system to a warmed-up state

of said system, the improvement comprising means connected to said lens and CRT assembly for automatically adjusting the focus of said image on the screen as a function of said ambient temperature.

4,525,746

TELEVISION SET

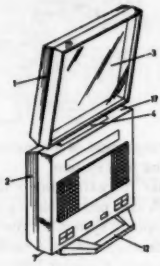
Hans Mangold, Fürth; Hans Eckert, Nuremburg, and Jürgen Schönborn, Fürth-Vach, all of Fed. Rep. of Germany, assignors to Grundig E.M.V., Fürth, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 458,918

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202046

Int. Cl.³ H04N *5/64*

U.S. Cl. 358—254 **15 Claims**



1. A television set comprising:

a video portion including a video screen which is self-contained in a first housing;

a receiver portion which is self-contained in a second housing, said receiver portion capable of receiving and conveying audio and video signals;

detachable connecting means coupled between said video portion and receiver portion so as to permit video or electrical signals to pass from the receiver portion to the video portion and wherein the decoupling of the connecting means from one of said portions allows for the separation of the respective housings;

said connecting means including hinge means capable of allowing the video portion to pivot up and down with respect to the receiver portion; and

said receiver portion includes handle means capable of providing a base on which to support the set while in addition facilitating the carrying of the set.

4,525,747

ANALOG-TO-DIGITAL IMAGE SIGNAL CONVERSION

Toshiyuki Sakai, 158, Nasahara-Motomachi, Takatsuki-shi, Ohsaka-fu; Yuichi Ohta, 2-9, Tennoh-cho, Takatsuki-shi, Ohsaka-fu; Michihiko Minoh, 18, Higashi-Kujo-Aketa-cho, Minami-ku, Kyoto-shi, Kyoto-fu, and Masatoshi Hino, 2-13-2, Kubo, Onomichi-shi, Hiroshima-ken, all of Japan

Filed Aug. 6, 1982, Ser. No. 405,766

Claims priority, application Japan, Aug. 6, 1981, 56-123303; Aug. 6, 1981, 56-123304

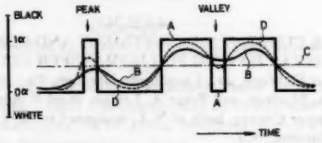
Int. Cl.³ H04N *1/40*

U.S. Cl. 358—284 **11 Claims**

1. A system for converting an analog image signal into a digital image signal, said analog image signal being obtained by scanning a two-dimensional image along a horizontal line progressively from top to bottom, said horizontal line including a predetermined number of picture elements in each of which the corresponding part of said analog image signal is converted into a digital value, said system comprising:

analog-to-digital converting means for converting said analog image signal into digital image signal by comparing said analog image signal with a threshold level;

extracting means for extracting peak and valley picture elements from said analog image signal, said picture element being determined as a peak picture element if its concentration is higher than those among all of its adjacent picture elements that are located in predetermined first and second directions with respect to said picture element in question, and said picture element being determined as a valley picture element if its concentration is lower than those among all of its adjacent picture elements that are located in said predetermined first and second directions with respect to said picture element in question; and



control means for controlling said threshold level in accordance with the information as to peak and valley picture elements from said extracting means so that the information as to peak and valley picture elements may be well reflected in said digital image signal.

4,525,748

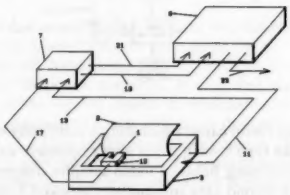
METHOD AND APPARATUS FOR SCANNING AND DIGITIZING OPTICAL IMAGES

Anthony K. Carbone, Rte. 1, Box 250, Bluemont, Va. 22012

Filed Jul. 30, 1982, Ser. No. 403,425

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—286 **30 Claims**



1. In a dot-matrix printer, the improvement comprising:

(a) a sensor for sensing the optical intensity levels of an image-bearing medium inserted on the printer paper feed mechanism, the sensor being mounted to a housing in the printer for continuous linear movement during scanning across the image-bearing medium; and

(b) means responsive to the printer strobe command for sampling the output of the sensor at predetermined intervals.

4,525,749

METHOD AND APPARATUS FOR SCANNING AN OBJECT BY USING THE LIGHT

Kiyoshi Maeda, and Masafumi Kawatani, both of Takatsuki, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 280,534, Jul. 6, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 535,905

Int. Cl.³ H04N *1/06, 1/20*

U.S. Cl. 358—290 **7 Claims**

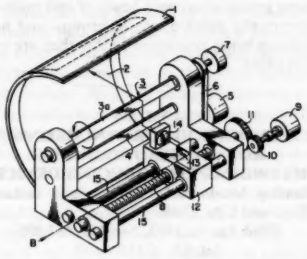
1. A method of scanning at least one object comprising the steps of:

mounting an object to be scanned on the cylindrically

curved interior surface of a stationary object holder, said surface having an elongated central axis;

rotating an elongated mirror having at least one reflective surface along the central axis of the holder;

disposing an elongated stationary mirror parallel to the rotating mirror having a reflective surface directed to deflect a light beam onto the reflective surface of the rotating mirror;



projecting a narrow light beam perpendicular to said axis onto the reflective surface of the stationary mirror which is deflected onto the reflective surface of the rotating mirror and then onto the object in the holder; and

translating the light beam along an axis parallel to the stationary mirror to scan the object.

4,525,750

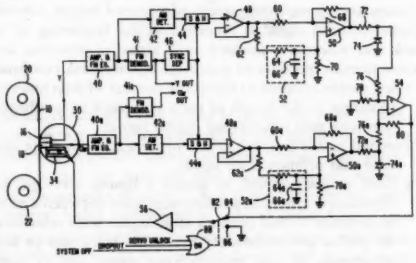
AUTOMATIC TRACKING SYSTEM FOR MULTITRACK RECORDERS

Kaarlo J. Hamalainen, Marlton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 10, 1982, Ser. No. 416,542

Int. Cl.[3] **G11B** *21/10;* **H04N** *5/782, 9/00*

U.S. Cl. 358—327 **5 Claims**



4. Television tape playback apparatus for playing back a first FM-modulated television video signal component from a first elongated prerecorded track of a magnetic tape and for playing back at least a second FM-modulated television video signal component representing a different type of information than said first color television video signal component from a second elongated track prerecorded parallel to said first track, said apparatus comprising:

first and second transducing means adapted for scanning said first and second tracks, respectively, at the same time;

transducer mounting means mechanically coupled to said first and second transducing means for moving said first and second transducing means as a unit at the same time in a direction lateral to the direction of said elongated first and second tracks under the control of a control signal;

first and second FM demodulation means coupled to said first and second transducing means, respectively, for recovering said first and second signal components, respectively, at the same time, said first and second signal components being subject to an undesirable degradation if said first and second transducing means mistrack;

first and second AM detection means coupled to said first and second transducing means, respectively, for detecting the amplitudes of said first and second signal components, respectively, to form first and second detected amplitude signals, respectively, at the same time, at least one of said first and second detected amplitude signals being reduced in response to a first direction of mistracking of said first and second transducing means; and

control means coupled to said first and second AM detection means and to said transducer mounting means for processing said concurrently produced first and second detected amplitude signals for generating a control signal for controlling said movement to position said first and second transducing means over said first and second tracks, respectively, in a feedback manner whereby said undesirable degradation due to mistracking is reduced.

4,525,751

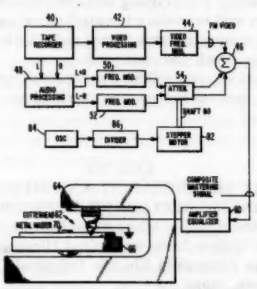
DISC RECORD WITH TAPERED GROOVE

Edward J. Freeman; John E. Economou; John G. Pecorari; Gunter John; Jerome B. Halter; Jack E. James; Richard M. Castle, all of Indianapolis, Ind., and Richard C. Palmer, Blawenburg, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1982, Ser. No. 412,185

Int. Cl.[3] **H04N** *5/92;* **G11B** *3/00*

U.S. Cl. 358—342 **40 Claims**



1. A method for producing a video disc record comprising the steps of:

(a) providing respective sound and picture signals, each modulated on a respective FM carrier wave;

(b) combining said FM carrier waves to provide a composite mastering signal;

(c) forming a spiral groove in a master substrate in accordance with said composite mastering signal; and

(d) varying the amplitude of said sound FM carrier wave without varying the amplitude of said picture FM carrier wave while forming said groove in said substrate.

4,525,752

APPARATUS FOR RECORDING AND REPRODUCING A DIGITAL SIGNAL

Nobuhiko Watanabe, and Masato Tanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,461

Claims priority, application Japan, Feb. 15, 1982, 57-22288

Int. Cl.[3] **G11B** *27/02, 5/00*

U.S. Cl. 360—13 **15 Claims**

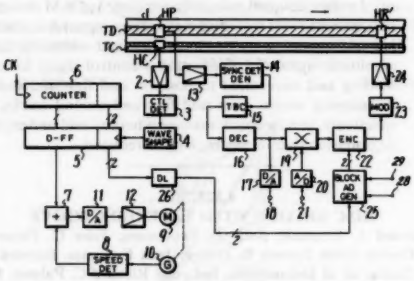
1. Apparatus for recording and reproducing a digital signal, said digital signal being in the form of successive data blocks, each data block including at least plural data words and a block address circulating with a predetermined phase relation to a

reference signal and recorded on a recording medium on which is recorded a control signal, said apparatus being characterized by:

means for reproducing said data blocks including said data words and block addresses from said recording medium;

time base correcting means for correcting a time base error contained in a reproduced data word fed thereto from said means for reproducing said data blocks;

means for reproducing said control signal from said recording medium;



means for generating a reference phase signal having a frequency that is an integral multiple of more than two times the frequency of said control signal;

sampling means for sampling said generated reference phase signal by said reproduced control signal so as to generate a phase compared output signal and a lock mode signal to determine block addresses; and

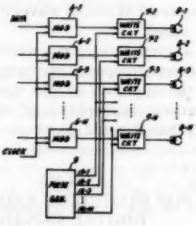
servo means for controlling the transport speed of said recording medium in response to said phase compared output signal.

4,525,753

CIRCUIT ARRANGEMENT AND METHOD FOR MAGNETIC RECORDING/REPRODUCING

Yasuharu Shimeki, Suita; Misao Kato, Katano; Hiroshi Matsushima, and Toshiro Ishikawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma, Japan

Filed May 26, 1983, Ser. No. 498,515
Claims priority, application Japan, May 27, 1982, 57-90740
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—45 **14 Claims**



1. A circuit arrangement for use with a magnetic recording apparatus for writing digital data on a plurality of tracks on a magnetic recording medium by means of a multi-track head, comprising:

(a) a plurality of modulators each responsive to a signal to be recorded on a single track for producing a modulated signal;

(b) a pulse generator for producing M pulse trains having different phases from another so that pulses of said M pulse trains do not coincide, wherein M is a positive integer other than one; and

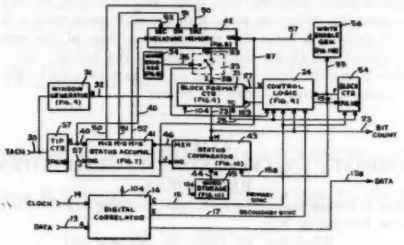
(c) a plurality of writing circuits each responsive to each of said modulated signals from said modulators and to each of said pulse trains from said pulse generator, said writing circuits producing respectively writing currents fed to heads of said multi-track head, said writing currents being fed to the heads such that writing currents having the same phase are fed to a plurality of said heads belonging to the same group where said heads of said multi-track head are electrically divided into M groups, said heads of the same group being positioned so that they are not adjacent to each other.

4,525,754

SYSTEM AND METHOD FOR SYNCHRONIZATION OF ROTARY HEAD MAGNETIC RECORDING/REPRODUCING DEVICES

Kirk H. Handley, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 6, 1983, Ser. No. 483,005
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—51 **15 Claims**



1. A system for providing synchronization of a digital signal recorded on and subsequently reproduced from a magnetic medium having recording tracks of a known length, wherein a synchronization signal is recorded at the beginning of each track and wherein a primary sync signal is provided in response to each reproduced synchronization signal, comprising:

a first means coupled to count the number of data bits corresponding to the length of each said track in synchronization with said reproduced digital signal;

a second means coupled to synchronize said counting means with said primary sync signal;

a third means coupled to detect a timing error between consecutive tracks as a difference signal between a normal occurrence of said primary sync signal with reference to the end of an immediately preceding track and an actual occurrence of said primary sync signal and to responsively provide, updata and store a correction signal; and

a fourth means coupled to apply said stored correction signal to offset said counting means in the absence of said primary sync signal to reduce said timing error.

4,525,755

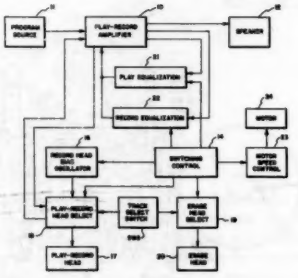
APPARATUS FOR RECORDING AND PLAYING BACK MAGNETIC TAPE CASSETTES AND THE LIKE

Thomas Meek, Hull, England, assignor to Norwood Industries, Inc., Salt Lake City, Utah

Filed Jul. 19, 1979, Ser. No. 59,274
Int. Cl.³ G11B *15/12, 5/45, 15/46*
U.S. Cl. 360—63 **10 Claims**

1. A record and playback apparatus for use with magnetic tape cassettes or the like, comprising a multi-gap record and playback head, each gap having associated gap coils; a multi-gap erase head, each gap having associated gap coils, the gas of said erase head corresponding to the gaps of the record and

playback head; power supply means for supplying power to the apparatus; a tape transport mechanism for passing the magnetic tape from a cassette or the like across said heads at a selected one of a plurality of speeds, said transport mechanism including a drive motor adapted to operate at a selected one of a plurality of speeds and having two terminals for the supply of power thereto; motor speed control circuitry including a first conductive path, one end of which is electrically connected to one terminal of said motor, and the other end of which is electrically connected one terminal of to the power supply; a second conductive path, one end of which is electrically connected to the other terminal of said motor and the other end of which is electrically connected to the other terminal of the power supply; voltage dropping means electrically connected in one of the conductive paths to apply substantially a first value of voltage to said motor to cause said motor to operate at a selected first desired speed; means for bypassing the voltage dropping means to apply substantially a second value of voltage to said motor to cause said motor to operate at a selected second desired speed, back electromotive force (emf) sensing means inserted between the ends of one of said conductive paths, said back emf sensing means adapted to provide an emf signal as a function of the magnitude of a back emf voltage generated by said motor, said emf voltage having a magnitude proportional to the angular speed of said motor; current control means electrically connected between the ends of one of said conductive paths for controlling the amount of current that flows through the motor; feedback means responsive to said emf signal for directing said current control means to control the amount of current that flows through the motor, said current being maintained at a level defined by a speed reference signal, and reference source means for generating a speed reference signal for each of the desired motor speeds, said speed reference signal being utilized by said feedback means to define the appropriate emf level needed to maintain a desired motor speed; a record and playback amplifier; speaker means; program source means; means for operating the apparatus to play back material previously recorded on said cassette's magnetic tape or to record material on said cassette's magnetic tape; means for selectively electrically connecting a single record and playback gap coil to the record and playback amplifier or for electrically connecting all or a selected number of the multiple record and playback head gap coils simultaneously to the record and playback amplifier, so that play signals are transmitted from the coil or coils to the amplifier or record signals are transmitted from the amplifier to the coil or coils; and means for selectively operating a single erase gap coil or all or a selected number of erase gap coils simultaneously when the apparatus is operated to record, said selected erase gap coil or coils corresponding to the selected record and playback gap coil or coils.



4,525,756

HEAD SHIFT MECHANISM

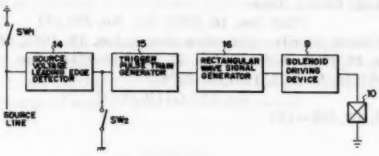
Kazuki Takai; Mitsuhiro Hakumoto, and Yasuo Yamada, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Japan

Filed Jul. 22, 1982, Ser. No. 400,721

Claims priority, application Japan, Jul. 24, 1981, 56-109352[U]; Jul. 25, 1981, 56-110473[U]; Jul. 25, 1981, 56-110474[U]

Int. Cl.³ G11B *21/02*

U.S. Cl. 360—75 **3 Claims**



3. A head shift mechanism in a tape player which comprises:

a solenoid means which moves a head provided in said tape player;

solenoid driving signal generating means which supplies said solenoid means with a driving signal to drive it;

source voltage detecting means which detects a source voltage to the tape player and generates detection signals to actuate said solenoid driving signal generating means; and,

head shift interrupting means which interrupts a head shifting motion of said solenoid means when said head reaches a predetermined position,

said head shift interrupting means including a head position detecting switch provided between said source voltage detecting means and said solenoid driving signal generating means and adapted to be turned off when the head is not located at said predetermined position so as to interrupt said driving signal to said solenoid driving signal generating means therethrough.

4,525,757

ROTARY HEAD ASSEMBLY

Kiyokazu Imanishi, Higashiosaka; Takashi Ichiyanagi, Hirakata; Yasuo Sakurai, Neyagawa; Hirouki Naka, Osaka, and Koji Nakagawa, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

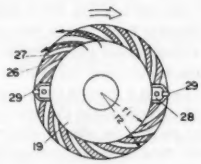
PCT No. PCT/JP83/00214, § 371 Date Mar. 6, 1984, § 102(e) Date Mar. 6, 1984, PCT Pub. No. WO84/00438, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 5, 1983, Ser. No. 598,548

Claims priority, application Japan, Jul. 6, 1982, 57-117168; Apr. 18, 1983, 58-68700

Int. Cl.³ G11B *15/60, 5/008, 15/64;* B65N *17/32*

U.S. Cl. 360—130.24 **1 Claim**



1. A rotary head assembly consisting of a fixed cylinder having a cylindrical part and a rotary cylinder, having a cylindrical part with a diameter approximately equal to that of the cylindrical part of this fixed cylinder, which rotates relatively with respect to said fixed cylinder in close contact with said fixed cylinder and supports the tape together with said fixed

cylinder, wherein pump-out type spiral grooves are provided on either plane of the confronting end faces of said rotary cylinder and fixed cylinder.

4,525,758

CARTRIDGE

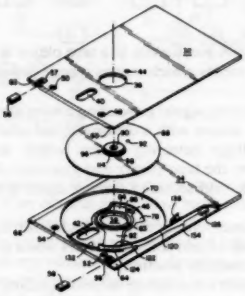
Koichiro Nakagawa, Takarazuka; Satoshi Suyama, Neyagawa; Masahiro Yanagi, Settsu, and Yasutaka Nakajima, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1982, Ser. No. 389,152

Claims priority, application Japan, Jun. 19, 1981, 56-95870; Jun. 19, 1981, 56-91146; Jun. 22, 1981, 56-97113; Jun. 22, 1981, 56-97114; Dec. 21, 1981, 56-207677

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—133 **21 Claims**



1. A cartridge to be inserted into a drive unit, said cartridge comprising:

a casing means having opposite sides and side edges for containing therein a rotatable recording medium disc to be drived by the drive unit, said casing means having one side edge open along more than 50% of its length, said recording medium disc having two opposite sides for recording information and also having a hub fixed therewith at its center;

a center window means, provided at opposite sides of the casing means, for allowing the hub to be inserted therethrough;

head window means, provided at opposite sides of the casing means for allowing a reading head to access information recorded on the two opposite sides of the recording medium disc;

shutter means, provided around the center window means, for normally covering the head window means, said shutter means being rotatable about the center window means in order to uncover the head window means when the cartridge is inserted into the drive unit;

an elongated flexible band means, provided along an outer side of the casing means and connected at one end to the shutter means, for rotating the shutter means, said flexible band means having a portion covering more than 50% of its length exposed outside at the one open side edge of the casing means so that the shutter means are automatically and indirectly rotated by an external force applied to the exposed portion of the flexible band means when the cartridge is inserted into the drive unit; and

means, provided on the casing means, for defining a moving path of the flexible band means along the one open side edge of the casing means;

whereby damage to and malfunctioning of the disc is prevented, when the shutter means covers the head window means.

4,525,759

ALUMINUM STORAGE DISC

Silvester P. Valayil, Shrewsbury, and Vita Aronson, Worcester, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Apr. 2, 1984, Ser. No. 595,927

Int. Cl.³ G11B *5/82*

U.S. Cl. 360—135 **7 Claims**

1. A metal plated aluminum storage disc comprising an aluminum storage disc substrate, an electrically anodized oxide layer over at least a surface of said aluminum storage disc substrate, said anodized oxide layer having cracks propogating throughout its surface which cracks define discrete oxide islands separated from each other by said cracks, and a layer of electrolytically deposited ferromagnetic metal over said discrete oxide islands, said ferromagnetic metal being columnar in structure conforming in size and shape to said oxide islands and extending upwards from said islands.

4,525,760

OPERATING LEVER DEVICE OF A MAGNETIC RECORDING TAPE DRIVING APPARATUS

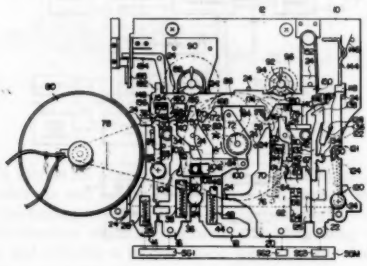
Shigeru Nemoto; Sinichi Saitou; Goro Kitajima, and Hazime Osada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,959

Claims priority, application Japan, May 28, 1981, 56-81719

Int. Cl.³ G11B *17/00*

U.S. Cl. 360—137 **9 Claims**



1. In an operating lever device for a magnetic recording tape driving apparatus which comprises a first base plate, a second base plate disposed parallel to the first base plate at a given distance therefrom, a plurality of operating levers located in the space between the first and the second base plates so as to be able to move slidably along the first and second base plates each between first and second positions, a pair of reel shafts protruded from the second base plate to the space outside that between the first and second base plates, and rotatory force generating means for selectively supplying rotatory force to the reel shafts, wherein a tape cassette is set on the second base plate,

one of various operating modes is set when one of the operating levers is located at the second positions, and each one of the operating levers has one end portion which is located outside the space between said first and second base plates when said operating levers slidably move between the first and second positions,

said operating lever device comprising:

a moving member disposed between said first and second base plates so as to be able to move along the first and second base plates between first and second positions, and having one end portion which is located outside the space between said first and second base plates so as not to face said tape cassette set on the second base plate when said moving member slidably moves between the first and second positions thereof; and

a coupling member located between one plane including the

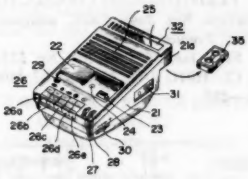
surface of said operating levers which faces said second base plate and the other plane including the surface of said second base plate which faces said tape cassette, the coupling member extending from the one end portion of the moving member to one of the operating levers, crossing at least one of the operating levers and coupled with said one end portion of said one operating lever and said one end portion of said moving member so as to shift said moving member from said first position to said second position thereof by the sliding movement of said one operating lever from said first position to said second position thereof, and to shift said moving member from said second position to said first position thereof by the sliding movement of said one operating lever from said second position to said first position thereof.

4,525,761

TRANSCRIBER WITH ERASING DEVICE

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 316,515, Oct. 29, 1981, abandoned, which is a continuation of Ser. No. 154,490, May 29, 1980, abandoned. This application Apr. 17, 1984, Ser. No. 600,607
Claims priority, application Japan, May 30, 1979, 54-72658
Int. Cl.³ G11B 5/12
U.S. Cl. 360—137 **6 Claims**



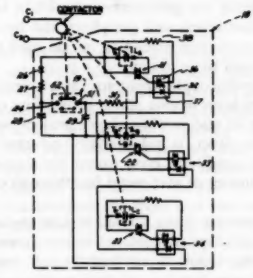
1. In a transcriber having a main body and means for transcribing information recorded on a cassette tape, the improvement comprising a through-hole provided in a part of the main body of the transcriber and an erasing device for magnetic tape stored in a cassette which has a magnet to generate magnetic flux in a prescribed direction to the through-hole, said through-hole being made sufficiently large to permit a tape cassette to pass there-through, and wherein said magnet is surrounded by magnetic material for shielding purposes.

4,525,762

ARC SUPPRESSION DEVICE AND METHOD

Claude R. Norris, 9039 Normandy La., Dayton, Ohio 45459

Filed Oct. 7, 1983, Ser. No. 539,920
Int. Cl.³ H01H 9/30
U.S. Cl. 361—13 **15 Claims**



1. An arc suppression device, for an electrical power switching device having at least one pair of contacts and an element movable between a first position in which each said contact pair is open and a second position in which each said contact pair is closed, comprising:

a switch having at least two states;

switch actuation means, couplable to the movable element of the switching device, for changing the state of the switch as the movable element moves from one of its said positions to the other;

at least one gate controlled thyristor couplable across each pair of contacts of the electrical power switching device; and

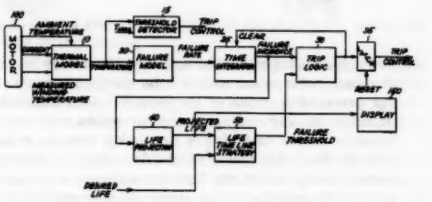
electronic circuit means, coupled to the switch and responsive to a change in the state of the switch, for gating on each said thyristor for an interval of time independent of a change of state of said mechanical switch.

4,525,763

APPARATUS AND METHOD TO PROTECT MOTORS AND TO PROTECT MOTOR LIFE

Robert M. Hardy, and William J. Premerlani, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,744
Int. Cl.³ H02H 7/08
U.S. Cl. 361—24 **19 Claims**



1. Apparatus for predicting the remaining useful life of a motor comprising:

(a) model means coupled to said motor for monitoring temperature of the windings of the motor and for generating a failure rate for said motor in response to temperature of the windings thereof;

(b) integrating means coupled to said model means for integrating the failure rate to produce a failure incidence for said motor; and

(c) life projection means coupled to said integrating means for predicting the remaining useful life of said motor.

4,525,764

SYSTEM FOR DISCONNECTING AN ELECTRICAL POWER SOURCE FROM A LOAD

Charles H. Titus, 323 Echo Valley La., Newtown Square, Pa. 19073

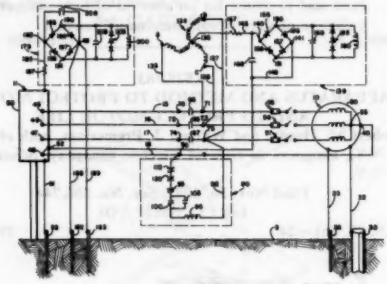
Filed Jun. 10, 1982, Ser. No. 387,182
Int. Cl.³ H02H 3/16
U.S. Cl. 361—42 **33 Claims**

1. A system for electrically disconnecting a power source from a load when a voltage potential in excess of a predetermined threshold is detected between a test point and a selected voltage reference point, comprising:

(a) switch means electrically connected intermediate the power source and the load for switchably connecting and disconnecting the power source with the load, said switch means including at least one main contact connected between the power source and the load, the main contact being actuatable between a closed position to connect the power source with the load and an open position to disconnect the power source from the load;

(b) voltage-reference means for providing reference voltage at the selected voltage reference point;

(c) voltage-detection means electrically connected with the test point and the selected voltage reference point for detecting when the voltage potential between the test point and the selected voltage reference point exceeds the predetermined threshold, said voltage-detection means including a first relay coil and a rectifier bridge having a.c. input terminals connected with the voltage reference point and the voltage test point and d.c. output terminals connected with the first relay coil to produce a change in energy state of the first relay coil when a voltage potential in excess of the predetermined threshold is detected between the test point and the reference point; and



(d) switch-actuator means for actuating the switch means to disconnect the power source from the load when a voltage potential in excess of the predetermined threshold is detected by the voltage-detection means, the switch-actuator means including a first relay contact coupled with the first relay coil to form a first relay, the first relay contact being actuatable between an open and a closed position in response to the change in energy state of the first relay coil, and a second contact-actuating coil coupled with the main contact to form a second relay, the second contact-actuating coil of the second relay being connected in series with said first relay contact to produce a change in energy state in the second contact-actuating coil to switch the main contact between the closed and open positions in response to actuation of the first relay contact between open and closed positions.

4,525,765

PROTECTIVE CIRCUIT FOR A SWITCHING TRANSISTOR

Antonio Brajder, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 6, 1983, Ser. No. 482,471

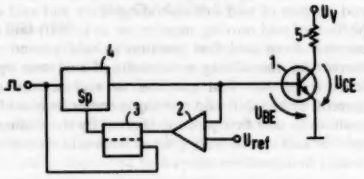
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216833

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ H02H *3/26*

U.S. Cl. 361—88 **5 Claims**

1. In a protective circuit for a switching transistor having switching-off means for switching off the driving pulses of the switching transistor, wherein the switching-off means is activated by comparator means which compares a voltage from the switching transistor at a first input with a reference voltage at a reference input and which switches off the driving pulses if the switching transistor is overloaded, the improvement comprising said first input of said comparator means being coupled to the base of the switching transistor and comparing the base-emitter voltage of the switching transistor with the reference voltage, said comparator means generating a signal at an output thereof for activating the switching-off means when the base-emitter voltage is outside a normal operating range determined by said reference voltage, memory means coupled between the output of said comparator means and a blocking input of said switching-off means for maintaining said



switching-off means in a state whereby said switching transistor is switched off when said switching transistor becomes overloaded, said memory means including a reset input for deactivating said switching-off means, said reset input activated by said driving pulses.

4,525,766

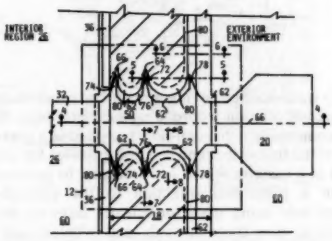
METHOD AND APPARATUS FOR FORMING HERMETICALLY SEALED ELECTRICAL FEEDTHROUGH CONDUCTORS

Kurt E. Petersen, San Jose, Calif., assignor to Transensory Devices, Inc., Fremont, Calif.

Filed Jan. 25, 1984, Ser. No. 573,508

Int. Cl.³ H01G *7/00;* **H05K** *5/02;* **H04N** *9/09*

U.S. Cl. 361—283 **21 Claims**



11. An apparatus for providing a hermetically sealed feedthrough conductor across the planar periphery between a first hermetically sealed region of a semiconductor substrate and a second region of said semiconductor substrate, wherein said first region is hermetically sealed by means of an insulator element electrostatically bonded to said planar periphery, comprising:

a planar insulator layer overlying said semiconductor substrate along the predetermined path of said feedthrough conductor across said periphery and having at least one planar projection extending out on each side of said path and shaped so as to come to a point;

a metal feedthrough conductor layer overlying said planar insulator layer having planar projections corresponding in position to said insulator layer projections such that said insulator layer is substantially covered by said feedthrough conductor layer except for a small border along the perimeter of said metal feedthrough conductor layer; and

said electrostatic bond formed at said planar periphery between said first and second regions creating a hermetic seal in the region of said feedthrough conductor layer by compression bonding of said insulator element to said projections of said insulator layer and said feedthrough conductor layer.

4,525,767

CERAMIC CAPACITOR AND DIELECTRIC COMPOSITIONS

John H. Alexander, Bishop's Stortford, England, assignor to Standard Telephones and Cables plc, London, England

Filed Jun. 11, 1984, Ser. No. 619,391

Claims priority, application United Kingdom, Jul. 13, 1983, 8318901

Int. Cl.³ H01G 4/10, 4/12

U.S. Cl. 361—321 9 Claims

7. A ceramic capacitor comprising a ceramic body formed from a fired dielectric composition comprising barium titanate ($BaTiO_3$), niobium pentoxide (Nb_2O_5) and gadolinium sesquioxide (Gd_2O_3), said ceramic body having opposed surfaces, a metal coating on each said surface, a connection terminal connected to each metal coating, and an encapsulating body of insulating material encapsulating the ceramic body.

4,525,768

CERAMIC CAPACITORS AND DIELECTRIC COMPOSITIONS

Jennifer M. Wheeler, Loughton, England, assignor to Standard Telephones and Cables, PLC, London, England

Filed Feb. 28, 1984, Ser. No. 584,337

Int. Cl.³ H01G 4/12; C04B 35/46; H01G 7/00

U.S. Cl. 361—321 24 Claims

12. A ceramic capacitor including dielectric comprising non-stoichiometric lead magnesium niobate, non-stoichiometric lead iron niobate and one or more oxide additives.

4,525,769

EQUIPMENT BOX FOR A POWER CONVERTER ARRANGEMENT

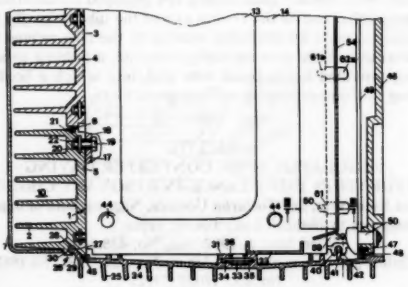
Kjeld Lehmann, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 16, 1984, Ser. No. 590,445

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312810

Int. Cl.³ H05K 7/20

U.S. Cl. 361—386 11 Claims



1. An equipment box for a power converter unit, comprising, a rear wall, side walls and a front wall, said rear wall having vertical cooling ribs on the outside thereof and a planar mounting surface on the inside thereof, a horizontally extending base member and a horizontally extending top member mounted by said rear wall, said base and top members fixing the positions of said side walls, a carrier member hingedly mounted by said base and top members for pivotal movement about a vertical axis between the front and rear walls, plate means removably mounting components on said carrier member in spaced relationship thereto, said side walls and rear wall having plug hinge means pivotally connecting said side walls to said rear wall, said hinge means, in each side wall including a vertical groove formed in one of the respective side wall and the rear wall and a rib formed on the other of the side wall and rear wall that is plugged into the groove and pivoted to abut against at least one of the base and top members.

4,525,770

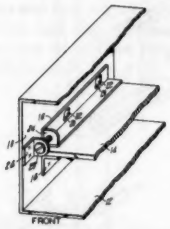
CLAMPING CIRCUIT BOARD GUIDES

Frederick A. Perretta, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1984, Ser. No. 595,809

Int. Cl.³ H05K 7/20

U.S. Cl. 361—399 5 Claims



4. A circuit board guide receiving a circuit board through the front of a chassis and extending along a side thereof, characterized by:

an L-shaped rail fixedly attached longitudinally along the side of the chassis;

an L-shaped rail movably attached longitudinally along the side of the chassis adjacent to the fixed rail with a space therebetween for receiving an edge of the circuit board;

at least one oblique slot in the side of the movable rail in contact with the side of the chassis;

at least one pin attached to the side of the chassis and extending just through the at least one oblique slot and having a head slightly larger than the slot to movably attach the movable rail to the side of the chassis;

a threaded end-plate on the movable rail; and

a chassis-mounted screw engaging said end-plate for applying longitudinal force to the movable rail, wherein interaction of the at least one pin and the at least one slot causes the applied longitudinal force to be translated into a normal force for clamping the board between the rails.

4,525,771

CIRCUIT BOARD MODULE MOUNTING UNIT

Urs Hänseler, Pfaffhausen; Urs Meier, Bassersdorf, and Franz Muther, Zürich, all of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Sep. 19, 1983, Ser. No. 533,662

Claims priority, application Switzerland, Sep. 30, 1982, 5777/82

Int. Cl.³ H05K 7/18

U.S. Cl. 361—413 9 Claims

1. A circuit board module mounting unit, comprising:

a rack containing two side walls, two front transverse support members and at least two rear transverse support members;

at least one pair of guide rails latchably attached to said transverse support members and defining at least one guide unit;

at least one connector member cooperating with at least one of said rear transverse support members;

at least one module support having at least one connector in electrical connection with said connector member;

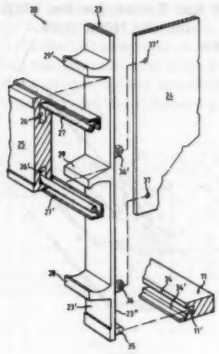
each of said guide rails having a rear end;

securing means including plug means provided on the rear end of at least one of said guide rails and securing said connector member to said at least one rear transverse support member;

at least one of said front transverse support members being provided with groove means;

said module support comprising at least one support element having an upper end and lower end;

a nose member provided on at least one of said ends of the support element, which nose member engages with said



groove means of said at least one front transverse support member for the stabilization of the modular assembly; and

a securing member having at least two predominantly longitudinal elastic shock-absorbing profiled sectional members mounted in mutually laterally spaced relationship on a front surface of the support element and securing each said module support in the rack.

4,525,772

VEHICLE LAMP ASSEMBLY

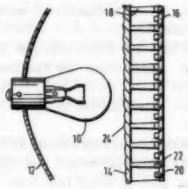
Anthony F. Peck, Kenilworth, England, assignor to Britax Vega Limited, England

Filed Jun. 1, 1984, Ser. No. 616,390

Claims priority, application United Kingdom, Jun. 7, 1983, 8315518

Int. Cl.³ F21V *11/06*

U.S. Cl. 362—290 **9 Claims**



1. A vehicle lamp assembly comprising a light source, a light transmitting member, baffle elements of light absorbing material extending perpendicular to the surface of the light transmitting member towards the light source, lens means located between the baffle elements and the light source and arranged to concentrate light from the light source between adjacent baffle elements, the ends of the baffle elements abutting the light transmitting member being of a non-neutral color chosen in accordance with the required appearance of the lamp assembly when the light source is not illuminated and the rest of the baffle elements are black.

4,525,773

LIGHT FIXTURE

Kurt Hesse, Nymphenburger Str. 4, D-1000 Berlin, and Hartmut Engel, Schloss; Heutingsheim, 7141 Freiberg am Neckar, both of Fed. Rep. of Germany

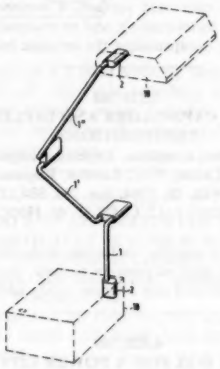
PCT No. PCT/DE83/00073, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03885, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 20, 1983, Ser. No. 566,136

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214651

Int. Cl.³ F21S *1/12*

U.S. Cl. 362—413 **6 Claims**



1. Light fixture with a lamp fixture carrier, a tube which surrounds at least one current carrier, and a carrier piece for the tube, characterized by the fact that said tube can be pushed together with said carrier piece and the lamp fixture carrier, the tube and the receptacles for the ends of the tubes, when pushed together, having connecting fixed contact pins or contact sockets, centrally attached to the corresponding parts, which have contact surfaces that are arranged concentrically to each other and to the central axis of the tube, whereby the connected parts are pivotable relative to the tube around the central axis of the corresponding tube end, a holding groove being provided in the inside tube end, into which a holding spring in a corresponding counter piece locks.

4,525,774

REGULATED AC-DC CONVERTER HAVING SATURATION INDUCTANCE IN RESONANT CIRCUIT

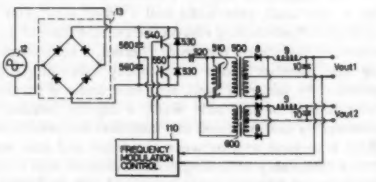
Jirou Kino, Seto, and Toshirou Uemura, Nagoya, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,948

Claims priority, application Japan, Nov. 24, 1981, 56-188132

Int. Cl.³ H02P *13/22*

U.S. Cl. 363—17 **5 Claims**



1. A switching power source device in which a DC voltage obtained by rectifying an AC voltage is converted into a high-frequency AC voltage which is subjected to voltage conver-

sion to output at least one AC voltage which is then rectified, comprising:

first rectifying circuit means for rectifying an AC voltage into a DC voltage;

switching means for converting the DC voltage obtained by rectifying the AC voltage in said first rectifying circuit means into a high-frequency AC voltage;

transformer means for subjecting the high-frequency AC voltage obtained by a conversion operation of said switching means to voltage conversion to output at least one AC voltage;

first circuit means for applying the high-frequency AC voltage obtained by the conversion operation of said switching means to said transformer means, said first circuit means including a capacitor connected in series between said transformer means and said switching means;

second rectifying circuit means for rectifying the at least one AC voltage obtained by the voltage conversion operation of said transformer means to output at least one DC voltage; and

frequency modulation control circuit means for subjecting said switching means to frequency modulation control so that at least one DC voltage output from said second rectifying circuit means attains a predetermined level;

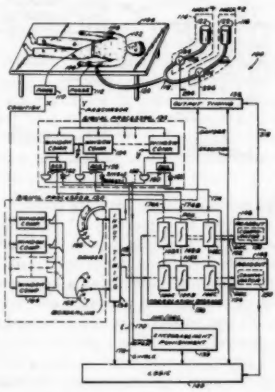
wherein said transformer means includes a first non-saturable transformer for receiving the high-frequency AC voltage obtained by the conversion operation of said switching means, said capacitor being connected in series between said first non-saturable transformer and said switching means, said first circuit means including a saturation inductance connected in parallel with said first non-saturable transformer and said switching means and forming a resonant circuit with said capacitor, said second rectifying means rectifying the AC voltage output from said first non-saturable transformer.

4,525,775

ADAPTIVE CONTROL SYSTEM

Grigory Eydelman, 141 St. Paul's Pl., West Hempstead, N.Y. 11552

Filed Nov. 1, 1982, Ser. No. 438,381
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—148 **26 Claims**



1. An adaptive control system providing an output signal in response to the reception, during a measurement interval, of a first input signal and a second input signal, the system comprising:

means for quantizing said first and said second input signals, each of said input signals being quantized into a plurality of ranges of values;

first and second sets of integrators corresponding to first and second ranges of values of said first input signal, individual ones of said integrators in each of said sets corresponding to respective ranges of values of said second input signal;

means for selecting one of said integrators corresponding to the joint occurrence, within said measurement interval, of a specific value range of said first input signal and a specific value range of said second input signal;

means for incrementing the amount of data stored in said one integrator upon said joint occurrence in the ranges of values of said first and said second input signals; and

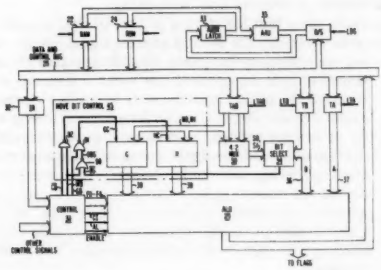
means for generating said output signal, said generating means being activated by said one integrator in response to the data stored therein.

4,525,776

ARITHMETIC LOGIC UNIT ARRANGED FOR MANIPULATING BITS

Ismail I. Eldumiati, Holmdel, and Michael K. Maul, Whitehouse Station, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 2, 1980, Ser. No. 155,317
Int. Cl.³ G06F *7/00, 15/20*
U.S. Cl. 364—200 **8 Claims**



1. A digital computer comprising

an instruction register;

a source of data;

an arithmetic logic unit;

a destination;

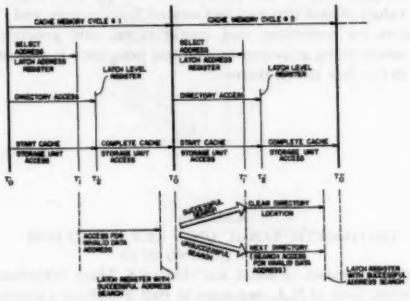
means for processing data from the source through the arithmetic logic unit and storing a result of the processing in the destination in response to instructions residing sequentially in the instruction register, each instruction requiring a single instruction interval for fetching data from a selected source in a store to an input of the arithmetic logic unit, processing the fetched data in the arithmetic logic unit, and storing the result of processing the fetched data into a selected destination in the store; and

means interconnecting with the selected source, the arithmetic logic unit and the selected destination and being responsive to a move bit instruction residing in the instruction register for moving a single bit from any selected one of a plurality of bit positions in the selected source only once through the arithmetic logic unit to any selected bit position of a plurality of bit positions in the selected destination during a single instruction interval without affecting the state of any other bit of the selected destination.

4,525,777
SPLIT-CYCLE CACHE SYSTEM WITH SCU CONTROLLED CACHE CLEARING DURING CACHE STORE ACCESS PERIOD

Marvin K. Webster, Glendale; Richard T. Flynn, Peoria; Marion G. Porter, and George M. Seminsky, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 3, 1981, Ser. No. 289,663
Int. Cl.³ G06F 9/36, 13/00
U.S. Cl. 364—200 **9 Claims**



1. In a data processing system including at least one central processing unit, at least one main memory, and at least one system controller unit coupled to said central processing unit and said main memory, a cache memory unit associated with said central processing unit comprising:

a cache store unit for storing groups of data signals;

a cache directory for storing address signal groups identifying main memory locations, an address signal group being stored in said cache directory when a data signal group from said identified main memory location is stored in said cache storage unit, said cache directory including a plurality of storage groups, each storage group representing a portion of an address signal group wherein a normal operation involving said cache memory unit includes a first period for accessing said cache directory and a second period for accessing said cache storage unit, said system control unit including apparatus to identify operations altering data signals of said main memory at a preselected location;

means coupled to a system controller unit for applying a location address signal group from said apparatus identifying data signal altering operations to said cache directory during said second period of a normal cache operation;

comparator for determining when said address signal group associated with said preselected location is stored in said cache directory; and

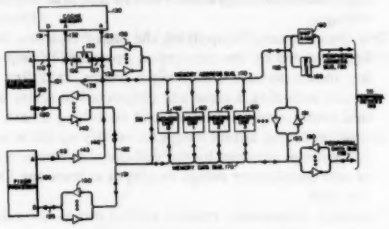
means for invalidating said address signal group associated with said preselected location in said cache directory during a succeeding second period of a normal cache operation after said determining means has found said preselected location address signal group stored in said cache directory.

4,525,778
COMPUTER MEMORY CONTROL

David A. Cane, Sudbury, Mass., assignor to Massachusetts Computer Corporation, Westford, Mass.

Filed May 25, 1982, Ser. No. 381,860
Int. Cl.³ G06F 13/00
U.S. Cl. 364—200 **11 Claims**

1. In a multi-tasking computer system having a memory with data information and a plurality of programs stored therein at least one memory location identified by a first address, said computer system further having a central processor including means for selecting one of said plurality of programs to run in said processor, means for computing a unique offset number for said selected program, means for generating a second address to identify information stored in said one memory location, and a translation store having at least one storage location and being responsive to a first preselected portion of said second address for producing information stored in said storage location, the improvement comprising,



means for receiving from said central processor and for storing an offset number computed for said selected program,

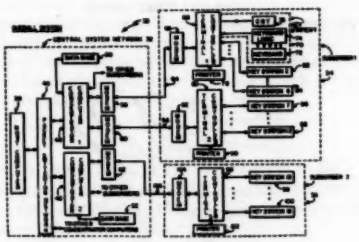
means for logically combining a temporarily-stored offset number with said first preselected portion of said address to produce logical combination signals, and

means for applying said logical combination signals to said translation store instead of said first preselected portion of said second address to perform a storage access.

4,525,779
CONVERSATIONAL VIDEO SYSTEM

Martin Davids, Leigh-on-Sea; Peter Blackman, London, and Lily Teo, Romford, all of United Kingdom, assignors to Reuters Ltd., London, England

Filed Mar. 30, 1983, Ser. No. 480,301
Int. Cl.³ G06F 3/14
U.S. Cl. 364—200 **45 Claims**



1. In a video communication network capable of providing textual data messages to a plurality of subscriber terminals throughout said network, at least a portion of said plurality of subscriber terminals comprising subscriber keystations, each of said subscriber keystations comprising a keyboard means for operator input of textual data messages and associated data control signals to said network via said keyboard means and a video display means for providing a textual video display of at least keyboard generated data input to said network; the improvement comprising at least one message switching interface means for routing video conversational textual data messages throughout said network, a plurality of said keystations being operatively connected to said one message switching interface means, said one message switching interface means comprising message routing logic means and storage means operatively connected to said message routing logic means for providing message routing logic control signals and further comprising

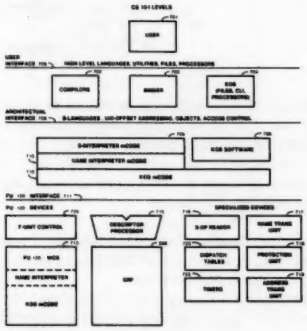
display control logic means and local video display storage means for locally storing video conversational textual data for providing a video display thereof to at least a pair of said keystations which are operatively connected together through said one interface means in a completed call in said network, said keyboard means comprising means for providing unique calling signals to said interface means for initiating calls to a designated keystation portion of said plurality of keystations in said network, said one interface means further comprising means for receiving said calling signals provided thereto for completing a call to said designated connected keystation, said message routing logic means comprising means for controlling the routing of said calling signals to said designated keystations to control the completion of said initiated calls, said display control logic means comprising means for providing on said pair of connected keystation video display means a video display of video conversational textual data transmitted between said connected keystations in said network with which said call is completed via said separate keyboard means associated with said pair of connected keystations, said one message switching interface means storage means comprising means for retrievably storing at least one subscriber created contact list for each of said keystations connected to said one message switching interface means, each of a plurality of said keyboard means being capable of providing at least a different one of said subscriber created retrievably stored contact lists to said one message switching interface storage means for each of a corresponding plurality of associated ones of said subscriber keystations whereby a plurality of different unique contact lists may be retrievably stored in said one message switching interface storage means, said contact lists each being capable of comprising a plurality of different unique designated keystation identification codes each of which corresponds to a different keystation in said network, said keystation keyboard means unique calling signal providing means being capable of providing a unique contact list calling signal corresponding to a designated one of said retrievably stored contact lists to said one message switching interface means message routing logic, said message routing logic comprising means capable of retrieving said stored one designated contact list in response to said unique contact list calling signal and sequentially providing a calling signal to each of said keystations designated by said identification codes in said contact list until a call is completed with the first one of said designated keystations which is available, said one message switching interface means comprising at least one host computer network control means and a plurality of keystation terminal controller interface means operatively connected between said keystations and said one host computer network control means with at least one keystation being operatively connected to and associated with one keystation terminal controller interface means for each of said plurality of keystation terminal controller interface means, said host computer network control means comprising said message routing logic means and said storage means operatively connected thereto, each of said keystation terminal controller interface means comprising said display control logic means and said local video display storage means for locally storing video conversational textual data for providing a video display thereof to at least one of said keystations connected to said keystation terminal controller interface means and local storage means for locally retrievably storing a copy of said subscriber created retrievably stored contact lists created by said one associated subscriber keystation and stored in said host computer network control means storage means and local message routing logic means for locally retrieving said locally stored one designated contact list designated by said one associated subscriber keystation unique calling signal providing means and providing a processed contact request calling signal to said host computer network control means message routing logic means for sequentially providing said calling signal to each of said keystations designated by said identification codes in said locally retrieved and processed contact list, said keyboard means providing said unique calling signals to said associated keystation terminal controller interface means, said keystation terminal controller interface means comprising means for providing said calling signal to said one host computer network control means and for receiving said calling signals therefrom for completing a call to said one connected keystation; whereby a single call may be simultaneously initiated by said one associated subscriber keystation to a plurality of predesignated keystations in said locally stored contact list to establish a textual data video conversation with the first free subscriber in said plurality.

4,525,780

DATA PROCESSING SYSTEM HAVING A MEMORY USING OBJECT-BASED INFORMATION AND A PROTECTION SCHEME FOR DETERMINING ACCESS RIGHTS TO SUCH INFORMATION

Richard G. Bratt, Wayland, Mass.; Gerald F. Clancy, Saratoga, Calif.; Craig J. Mundie, Cary, N.C.; Stephen I. Schleimer, Chapel Hill, N.C., and Steven J. Wallach, Saratoga, Calif., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 266,409, May 22, 1981, abandoned.
This application May 31, 1984, Ser. No. 616,773
Int. Cl.[3] G06F *9/34, 9/46, 13/00*
U.S. Cl. 364—200 **17 Claims**



1. In a digital computer system including

memory means for performing memory operations including storing and providing items of data, said items of data including instructions;

processor means connected to said memory means for performing operations in response to said instructions including processing said items of data;

memory organization means operative on said memory means for organizing said memory means into objects identified by unique identifiers and allowing the location of said items therein, each said item being associated with an object and addressable by a logical address specifying the unique identifier of the object with which said item is associated and an offset specifying the location of said item its associated object,

said memory organization means further identifying for each one of said objects a selected set of subjects representing entities for which said processor means responds to said instructions;

memory operation specifier generation means in said processor means responsive to said instructions for providing a memory operation specifier for each item processed by said processor, said memory operation specifier for a given item specifying the object in which said given item is to be located and one of said memory operations; and

memory operations means responsive to a memory operation specifier which includes a logical address and a memory command specifying a memory operation for performing the memory operation specified by the memory command on the item specified by the logical address for

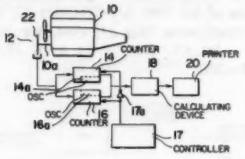
a current subject for which said processor means is currently executing said instructions only when said current subject is one of the subjects in the selected set of subjects identified for the object specified in said memory operation specifier.

4,525,781

METHOD OF DETERMINING FLUCTUATIONS IN INDICATED MEAN EFFECTIVE PRESSURE OF ENGINE AND APPARATUS THEREFOR

Toshiaki Konomi, and Shinobu Ishiyama, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 24, 1981, Ser. No. 305,352
Claims priority, application Japan, Oct. 1, 1980, 55-136995
Int. Cl.³ G01M *15/00;* **G06F** *15/36*
U.S. Cl. 364—431.01 **8 Claims**



2. Method of determining a deviation in an indicated mean effective pressure of an engine comprising the steps of:

(a) detecting top dead centers of a No. i cylinder and a No. i+1 cylinder of said engine, said No. i+1 cylinder being the next cylinder in said engine to reach top dead center after said No. i cylinder;

(b) detecting rotational speeds ω_{ci} and $\omega_{c(i+1)}$ of a crankshaft at said top dead centers of said No. i cylinder and said No. i+1 cylinder, respectively;

(c) determining a mean pressure Pωi of said No. i cylinder in response to said detecting step (b) in accordance with the following formula:

$$P\omega i=(\omega^2_{c(i+1)}-\omega^2_{ci})I/2Vh$$

where: I is a moment of inertia and Vh is a volume of the cylinder;

(d) calculating a mean value $\overline{P\omega i}$ of a mean pressure Pωi on the basis of a plurality of said mean pressures Pωi;

(e) determining a deviation ΔPii of an indicated mean effective pressure Pii of said No. i cylinder from a subtractive result of $(P\omega i-\overline{P\omega i})$; and

(f) outputting an indication of said deviation of the indicated mean effective pressure Pii of said No. i cylinder to an output device.

7. Apparatus for determining a deviation in an indicated mean effective pressure of an engine comprising:

(a) means for producing a top dead center signal at a first angular position of a crankshaft corresponding to a top dead center of a cylinder;

(b) means for producing a plurality of crank angle signals at a plurality of second angular positions of said crankshaft;

(c) means for producing a plurality of fixed frequency signals;

(d) means for counting said fixed frequency signals between a predetermined number of said crank angle signals;

(e) means for: (1) determining a minimum rotational speed ω_{ci} of said crankshaft at around said top dead center during a compression stroke of a No. i cylinder of said engine in accordance with a count value of said counting means, (2) determining a maximum rotational speed ω_{maxi} of said crankshaft during an expansion stroke of said No. i cylinder in accordance with the count value of said counting means, (3) calculating a mean rotational speed ω_{mii} of said No. i cylinder by using the following formula:

$$\omega_{mii}=\frac{\omega_{ci}+\omega_{maxi}}{2},$$

(4) calculating a ratio Dii of said No. i cylinder by using the following formula:

$$Dii=(\omega_{maxi}-\omega_{ci})/\omega_{mii},$$

(5) determining a minimum rotational speed $\omega_{c(i+1)}$ of said crankshaft at around said top dead center during a compression stroke of a No. (i+1) cylinder in accordance with the count value of said counting means, said No. (i+1) cylinder reaching top dead center immediately after said No. i cylinder,

(6) calculating a mean rotational speed $\omega_{mi(i+1)}$ of said No. (i+1) cylinder by using the following formula:

$$\omega_{mi(i+1)}=\frac{\omega_{c(i+1)}+\omega_{maxi}}{2},$$

(7) calculating a ratio Di(i+1) of said No. (i+1) cylinder by using the following formula:

$$Di(i+1)=(\omega_{maxi}-\omega_{c(i+1)})/\omega_{mi(i+1)},$$

(8) determining a mean pressure Pωi of No. i cylinder in accordance with the following formula:

$$P\omega i=(Dii\cdot\omega^2_{mii}-Dii(i+1)\cdot\omega^2_{mi(i+1)})I/Vh$$

where: I is a moment of inertia and Vh is a volume of cylinder,

(9) calculating a mean value Pωi of said mean pressure Pωi, and

(10) determining a deviation ΔPii of an indicated mean effective pressure Pii of said No. i cylinder from a subtractive result of $(P\omega i-P\omega i)$; and

(f) means for outputting an indication of said deviation of the indicated mean effective pressure Pi of said No. i cylinder to an output device.

4,525,782

PROCESS FOR DETERMINING MAINTENANCE AND SERVING INTERVALS ON MOTOR VEHICLES

Dieter Wohlfarth, Esslingen, and Walter Kostelezky, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,922
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110774
Int. Cl.³ G06F *3/14, 15/20;* **G07C** *5/08;* **B60S** *5/00*
U.S. Cl. 364—431.01 **33 Claims**

1. A method for determining maintenance and service intervals for a vehicle comprising

storing a limit value for a vehicle command parameter,

sensing an actual value of the command parameter,

performing a first comparison of the sensed actual value with the limit value for the vehicle command parameter,

displaying a maintenance alarm when said first comparison step produces a substantial match of the two values,

storing a limit value for at least one vehicle operating parameter,

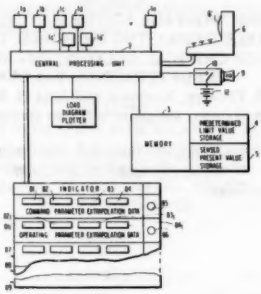
storing a maintenance indication threshold value as a fraction of said limit value for said at least one operating parameter,

sensing an actual value of the at least one operating parameter, performing a second comparison of the sensed actual value with the maintenance indication theshold value for the at least one operating parameter if the first comparison step produced a substantial match, displaying at least an additional maintenance alarm for said operating parameter

when said second comparison step determines that the actual value of said sensed operating parameter exceeds the maintenance indication theshold value.

33. A method of determining maintenance and service intervals in motor vehicles, wherein the driver is given a recommendation by means of a display to perform maintenance or servicing when a value of a guiding parameter, determined to be important for maintenance or servicing, corresponds to a predetermined value of the guiding parameter stored in a memory of a computer, whereby the determined value of this guiding parameter can be changed by other operating parameters, comprising the steps of

receiving in a computer memory additional characteristic values for the condition of vehicle parts requiring maintenance as a function of wear,



comparing said values with values likewise stored in the memory and corresponding to the wear limits of the vehicle parts in question,

generating data representing a load diagram in the computer from additional operating parameters,

determining from at least the additional operating parameters whether the vehicle is being operated primarily in the partial load or full load mode,

extrapolating a wear-limiting value for each of the vehicle parts from at least a corresponding stored value by means of the data representing the load diagram, and

matching the wear-limiting values of the vehicle parts with data representing maintenance or servicing determined by the guiding parameter, when the values and data lie within a fixed range of tolerance of the data.

4,525,783

METHOD AND APPARATUS FOR DETERMINING THE INDIVIDUAL MANIPULATED VARIABLES OF AN INTERNAL COMBUSTION ENGINE, AND IN PARTICULAR OF A GAS TURBINE

Jürgen Pischke, Markgröningen, and Wolfgang Nonnenmann, Pforzheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 78,613, Sep. 24, 1979, abandoned. This application Dec. 5, 1983, Ser. No. 558,556

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841750

Int. Cl.[3] **F02C** *9/04;* **F02D** *28/00, 5/00*

U.S. Cl. 364—431.11 **6 Claims**

1. A method for determining the individual input variables of an internal combustion engine such as a gas turbine or the like, derived from given and measured operating characteristics such as rpm and temperature in a computer having a timing control, a multiplex means for preparing at least some of said input variables, a feedback control program, a data detection program and a data output program, and an output memory having means for delivering data to indicating means and final control means for said engine, comprising the steps of

generating control data by repetitively operating said control program from beginning to end to beginning,

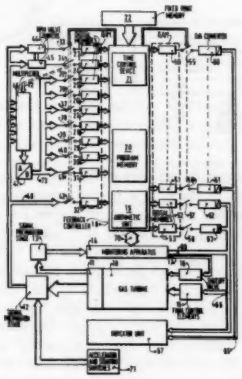
operating at predetermined times alternatively with said control program said data detection program and said data output program,

interrupting said control program at predetermined fixed times, wherein said timing control operates

said data detection program and said data output program when said control program is interrupted, and

feeding the output signals from said data output program in a time-controlled manner to said output memory.

2. An apparatus for determining the individual input variables of an internal combustion engine, such as a gas turbine or the like, derived from given and measures operating characteristics such as rpm and temperature, in a computer having a timing control, a multiplex means for preparing at least some of said input variables, a feedback control program, a data detec-



tion and a data output program, said programs being operated in alternation, and said computer comprising

a controller having an arithmetic unit, a program memory and a time control device;

at least one input memory means for input data, and at least one output memory means for output data,

said output memory means having means for delivering said output data to at least one of an indicating means and a final control means for said engine, and

said input memory means and said output memory means being associated with said arithmetic unit, wherein the time control device interrupts the control program at particular fixed times and said timing control switches the computer over to the data detection and data output program during which input variables are written into said at least one input memory means and output variables are read out of said at least one output memory means.

4,525,784

STEERING AND STABILIZATION SYSTEM FOR VEHICLES

Peter Hamel, and Rüdiger Karmann, both of Brunswick, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

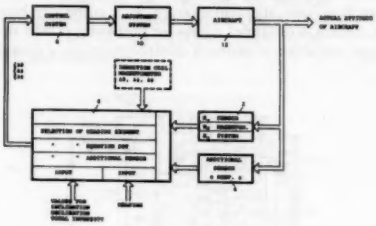
Continuation of Ser. No. 359,001, Mar. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 126,434, Mar. 3, 1980, abandoned. This application Aug. 13, 1984, Ser. No. 640,531

Int. Cl.[3] **G05D** *1/06;* **G01C** *17/38;* **G06F** *15/50*

U.S. Cl. 364—434 **9 Claims**

1. A steering and stabilization system for a vehicle including means for the determination of attitude of the vehicle comprising at least two magnetometers mounted in the vehicle and

fixed with respect to the direction of the fore-and-aft axis thereof as to determine each coordinate of a set of three orthogonal coordinates of attitude of the vehicle, and an additional sensor of attitude to provide supplementary information relating to one of the coordinates of attitude determined by said magnetometers, each of said magnetometers being provided with means for inducing a compensating current to its magnetic core for a null point adjustment of its magnetic field for the attitude required for a predetermined course of the vehicle, the system also including a microcomputer on board of said vehicle including input means to receive and store data of the earth's magnetic field, namely the inclination, declination and total intensity, relating to the operational region of the vehicle, as well as data of a predetermined course for said vehicle, and further including input means for the output signals of said magnetometers and said additional sensor, said microcomputer being programmed for the transformation of the orthogonal coordinates determined by said magnetometers into respective geodetic coordinates by said computer during use of the system, for coupling of signals representative of said transformed coordinates with signals representative of said supplementary information and calculating and generating control signals for the steering and stabilization system of the vehicle and for adjustment of said compensating current depending on the attitude required.



4,525,785

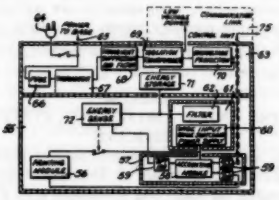
ELECTRONIC POSTAGE METER HAVING PLURAL COMPUTING SYSTEM

John H. Soderberg, Monroe, N.Y.; Alton B. Eckert, Norwalk, and Robert B. McFiggans, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 277,050, Jun. 24, 1981, abandoned, which is a continuation of Ser. No. 89,413, Oct. 30, 1979, Pat. No. 4,301,507. This application Apr. 28, 1983, Ser. No. 487,418

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—464 **10 Claims**



1. In a postage meter comprising a data entry means, an accounting means coupled to the data entry means for receiving data, and a printing means including a printer and printing systems and coupled to said accounting means for receiving printing data, at least said accounting means and printing means being within secure walls, said postage meter comprising a first microprocessor system for controlling said data entry means, a second microprocessor system for controlling arithmetic operations in said accounting means, and a third microprocessor system for controlling the operation of said printer in accordance with a printing program, and means interconnecting said first and second microprocessor systems and said second and third microprocessor systems for serial bit-by-bit data flow therebetween, said interconnecting means comprising a pair of one-way transmission paths between said first and second microprocessor systems and between said second and third microprocessor systems, data flow on said one-way transmission paths being inhibited only in response to the detection of data flow on the other transmission path of the respective pair of transmission paths.

4,525,786

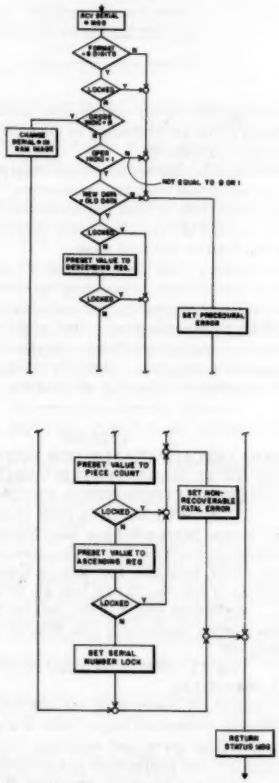
ELECTRONIC POSTAGE METER HAVING A ONE TIME ACTUABLE OPERATING PROGRAM TO ENABLE SETTING OF CRITICAL ACCOUNTING REGISTERS TO PREDETERMINED VALUES

Raymond R. Crowley, Newtown, and John H. Soderberg, Stratford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 12, 1982, Ser. No. 397,398

Int. Cl.³ G06F *3/00, 15/00*

U.S. Cl. 364—466 **14 Claims**



1. A postage meter, comprising:

printing means for printing postage;

a computing means coupled to said printing means for accounting for postage printed by said printing means;

non-volatile memory means coupled to said computing means, said non-volatile memory including memory locations for storing critical meter accounting data;

a program stored coupled to said computing means and adapted to store programs to control the operation of said computing means; and

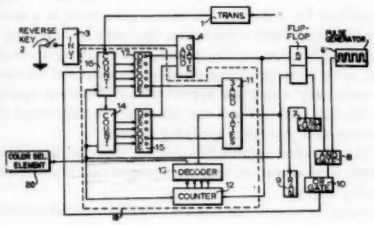
said program store containing a one-time actuable program operable to cause said computing means to write predetermined data into said non-volatile memory locations for storing critical accounting data such that said critical accounting data is set to predetermined values, and said program store further operable to prevent said computing means from reentering said program for writing said predetermined data into said non-volatile memory if said non-volatile memory locations have been previously set to said predetermined values.

4,525,787

PROGRAM AUTOMATON FOR WEAVING MACHINES

Krum K. Tzvetkov, Sofia, Bulgaria, assignor to Centralen Savet na Nauchnotechnicheski Sayusi, Sofia, Bulgaria

Filed Sep. 17, 1982, Ser. No. 419,325
Int. Cl.³ D03D *51/08*
U.S. Cl. 364—470 **6 Claims**



1. A program automaton for a weaving machine having a transducer coupled to a crankshaft therein, a block for weft programming coupled to said transducer, a block for subroutines coupled in a feedback loop with said block for weft programming, a block of selective electromagnets coupled to said block for weft programming for alternatively selecting a color band, a block for weave programming also coupled to said transducer, an electronic keys block coupled to said block for weave programming, a control block coupled to both said transducer and said electronic keys block for controlling weaving electromagnets, and a block for deweaving of complex programs incorporated in said blocks for weft programming and subroutines, characterized in that said block for deweaving at complex programs comprises:

means for indicating the reversal of said weaving machine;

a first AND-gate coupled to said indicating means;

a counter-switch having an addition and subtraction input, the output of said first AND-gate being coupled to said subtraction input;

a high-frequency pulse generator;

a second AND-gate coupled to the output of said high-frequency pulse generator and also to said first AND-gate; and

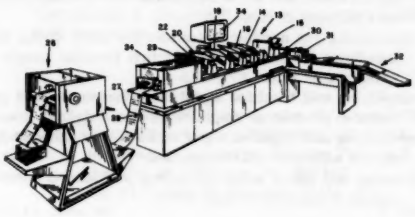
counter means also having an addition and a subtraction input, said second AND-gate being coupled through an OR-gate to said subtraction input, said transducer also being coupled to said OR-gate, said counter means having outputs coupled to said first AND-gate.

4,525,788

SCANNER INTERFACE CIRCUIT FOR UNIVERSAL MULTI-STATION DOCUMENT INSERTER

Robert K. Gottlieb, Bridgeport, and Peter N. Piotroski, New Canaan, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 1, 1982, Ser. No. 394,390
Int. Cl.³ G06F *15/20*; G06G *7/48*
U.S. Cl. 364—478 **11 Claims**



1. In a document inserter having a plurality of feeder stations, a central processor for providing a control signal to the feeder stations, the central processor having a supervisory program stored therein including a data table and a configuration PROM which includes information on the type of feeder stations and the functions to be performed thereby and a feeder interface circuit having a unique address code and which receives address and command signals from the central processor, scanner interface circuits associated respectively with scanners at each of the feeder stations comprising:

address means for providing each scanner with a unique address code a portion of which is identical to the address code of the feeder station with which it is associated,

distributed processor means for storing a scanner program containing instructions for scanning coded documents, and

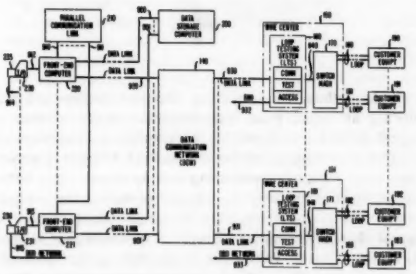
means interconnecting the scanner interface circuit, the feeder interface circuit and the central processor for enabling scanning of a document at each feeder station in response to appropriate addresses and commands from the central processor.

4,525,789

PROGRAMMABLE NETWORK TESTER WITH DATA FORMATTER

Kyran B. Kemper, Mendham, and Harvey Rubin, Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,184
Int. Cl.³ G06F *15/20*; G01R *15/12*; H03G *3/30*
U.S. Cl. 364—481 **7 Claims**



1. A method for producing a digital word indicative of electrical characteristics of a circuit under test comprising the

steps of applying a source signal to a port of said circuit and detecting a resultant signal produced at said port in response to said source, said method further comprising the steps of

generating a demodulating signal equal in frequency to said source signal,

frequency-shifting said resultant signal by demodulating said resultant signal with said demodulating signal and low-pass filtering to produce a baseband signal,

converting said baseband signal with analog-to-digital (A/D) means into a first encoded data sample represented by a plurality of bits,

determining the number of consecutive zeros in the most significant bit positions of said first encoded sample to obtain a gain factor,

amplifying said baseband signal in proportion to said gain factor to produce an amplified baseband signal,

converting said amplified signal into a second encoded data sample with said A/D means, and

forming said digital word by storing said second encoded sample in locations of said word.

4,525,790

METHOD FOR OSCILLATING ULTRASONIC WAVES AND A MICROCOMPUTER'S BUILT-IN ULTRASONIC WAVE OSCILLATOR CIRCUITRY

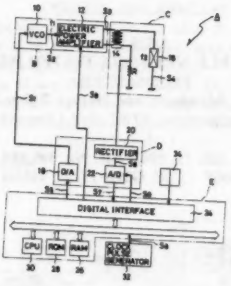
Masahiro Nakamura, Tokyo, Japan, assignor to Ohtake Works Company, Ltd., Tokyo, Japan

Filed Aug. 27, 1982, Ser. No. 412,274

Claims priority, application Japan, Aug. 28, 1981, 56-134248

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—484 **6 Claims**



1. A method for oscillating ultrasonic waves comprising, storing an initial peak high-frequency wave current value signal gained by inspecting an oscillating frequency of an oscillator, storing an up-dated peak high-frequency wave current value signal by comparing said up-dated signal with said initial signal previously stored, and repeating the comparison every time an up-dated high-frequency wave current value signal, flowing through a vibrator of said oscillator, is detected as being of lower value, due to changes in the resonant frequency being inspected, and automatically tracking the resonant frequency of said vibrator to renew said up-dated peak high-frequency wave current value signal flowing through said vibrator.

4,525,791

METHOD AND APPARATUS FOR REDUCING VIBRATIONS OF STATIONARY INDUCTION APPARATUS

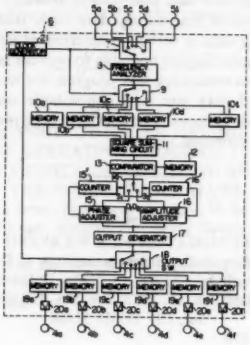
Syuya Hagiwara, Mito, and Yasuro Hori, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,564

Claims priority, application Japan, Aug. 11, 1981, 56-124673

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—508 **11 Claims**



1. A method for reducing vibrations generated in a stationary induction apparatus comprising the steps of detecting the vibrations by vibration sensing means, and applying a vibration applying force capable of suppressing the detected vibrations to said stationary induction apparatus by vibration applying means; wherein said method comprises the further steps of:

energizing said vibration applying means;

receiving detected amplitude values of the vibrations from a plurality of vibration sensors constituting said vibration sensing means;

calculating the sum of the squares of said amplitude values of vibration; and

varying the phase and amplitude of the vibration applying force outputted from said vibration applying means in the direction of decreasing the calculated sum of the squares of amplitude values of vibration.

4,525,792

UNIDIRECTIONAL CAPACITIVE FLUID-GAUGING SYSTEMS

Peter Clinton, Winchester, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Mar. 10, 1983, Ser. No. 474,094

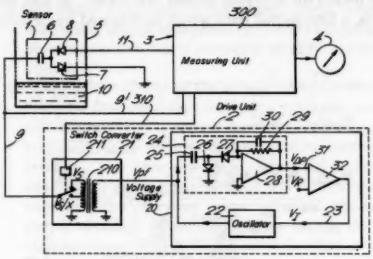
Claims priority, application United Kingdom, Mar. 29, 1982, 8209169

Int. Cl.³ G01F *23/26*; H01H *35/00*

U.S. Cl. 364—509 **9 Claims**

1. In a fluid-gauging system of the kind including a capacitive sensor unit adapted for immersion within a fluid, electrical supply means arranged to supply an alternating electric signal to said sensor unit such that the output of the sensor unit varies in accordance with change in fluid quantity, and a measuring unit connected to receive the output of said sensor unit, said sensor unit including a capacitor and at least one temperature-sensitive unidirectional current device connected to the output of said capacitor, the improvement wherein said supply means includes switching means, means for controlling said switching means to switch said switching means between two states in the first of which the alternating signal is supplied to said sensor unit with a peak amplitude of a first value and in the second of which the alternating signal is supplied to said sensor unit with a peak amplitude of a second value different from

said first value, and wherein said measuring unit calculates the voltage across said unidirectional current device from the



respective outputs of said sensor unit when said switching means is in said first state and when said switching means is in said second state.

4,525,793

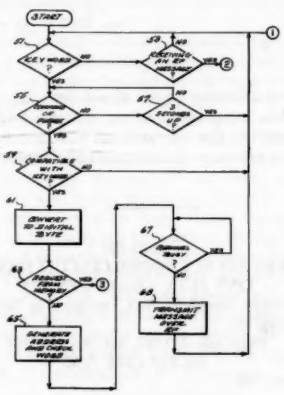
VOICE-RESPONSIVE MOBILE STATUS UNIT

Bill L. Stackhouse, Charlottesville, Va., assignor to General Electric Company, Lynchburg, Va.

Continuation of Ser. No. 337,762, Jan. 7, 1982, abandoned. This application Jul. 17, 1984, Ser. No. 631,017

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513.5 **5 Claims**



1. A voice responsive mobile status unit for use in an r.f. communication system having r.f. communication links between mobile and fixed base stations, said mobile status unit being associated with at least one of said mobile stations and comprising:

(A) a mobile r.f. transceiver capable of sending and receiving digitized data signals via an r.f. communication link;

(B) speech recognition means capable (1) of receiving analog speech signals, (2) of recognizing any one of a predetermined set of speech phrases from analysis of said analog speech signals, and (3) of producing a corresponding one of a predetermined set of digital data signals in response to such recognition; and

(C) control means connected to said mobile r.f. transceiver and to said speech recognition means for causing transmission of a predetermined digital data message signal over said r.f. communication link in response to the digital outputs of said speech recognition means;

said control means including:

(i) keyword recognition means for recognizing one of a predetermined subset of said digital data signals as an acceptable keyword and for initiating a valid message phrase time window in response to such recognition; and

(ii) valid message recognition means, which is operative during said valid message phrase time window, (1) to recognize one of a predetermined subset of said digital data signals as a valid message for the particular just-recognized keyboard which initiated the current time window and (2) to permit transmission of said digital data message signal only in the event such a valid message phrase is recognized as having occurred within said time window.

4,525,794

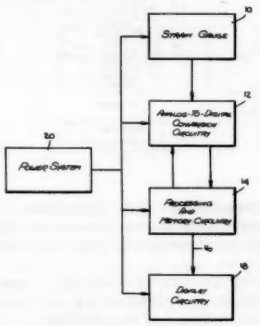
ELECTRONIC BALANCE

Daniel G. Scheffer, Montville; Christopher W. Brock, Whippany, and Douglas B. Schumer, Middletown, all of N.J., assignors to Ohaus Scale Corporation, Florham Park, N.J.

Filed Jul. 16, 1982, Ser. No. 399,647

Int. Cl.³ G06F *15/20;* **G01G** *13/14*

U.S. Cl. 364—567 **8 Claims**



1. An electronic balance comprising:

transducer means for producing a first electrical signal containing analog information representative of the weight of an object being weighed by means of said balance;

analog-to-digital conversion means for producing a series of second signals comprising a series of width-modulated pulses representative of said analog data in said first signal and the information contained in each said pulse including an error, said errors being non-cumulative;

filter means for reducing display flutter by filtering several subsets of said pulses sequentially to produce a series of third electrical signals, each said third electrical signal being representative of the data contained in a corresponding said subset of pulses; said filter means comprising processor means programmed for adding a series of said pulses, reducing the sum of said series by a predetermined fraction, and adding to the reduced sum the total of a second series of said pulses, and reducing the new total by said fraction; each said series including the same number of said pulses, and each said subset of said pulses including several said series; and

means for summing said third electrical signals to produce an output signal representative of said weight.

4,525,795

DIGITAL SIGNAL GENERATOR

Harvey Rubin, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,176

Int. Cl.³ G06F *1/02;* **H03B** *19/00*

U.S. Cl. 364—721 **2 Claims**

1. A method for digitally generating an electrical signal representative of a cosinusoidal tone having a frequency in a

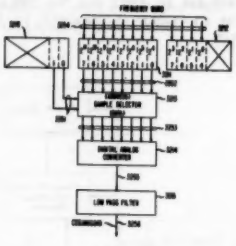
preselected band with: means for providing a frequency word f_w indicative of said frequency; first storage means for storing cosinusoidal amplitudes representative of first quadrant values of a cosinusoidal wave indicative of the highest frequency in said band and discretized at sampling rate f_s; and processing means, including an accumulator, producing samples of said signal at a strobing rate f_r, $f_r < f_s$, said method comprising the steps of

(i) storing the negative of said amplitudes in second storage means,

(ii) scaling said word f_w by a factor directly proportional to said sampling rate and inversely proportional to said strobing rate to produce a converted frequency word f_c, $f_c < f_r/2$,

(iii) adding said converted frequency word to said accumulator,

(iv) determining a quadrant pointer from a plurality of the most significant positions of said accumulator,



(v) determining a sample index from a fraction of the positions in said accumulator unallocated to said plurality;

(vi) selecting one of said storage means as determined by said pointer,

(vii) extracting the contents of a location in said one of said storage means as determined by said pointer and said index to produce one of said samples of said signal, said steps (iii) through (vii) requiring a time period T to produce said one of said samples, $f_s < 1/T \leq f_r$,

(viii) converting said one of said samples to an analog form in a digital-to-analog converter operating at said strobing rate,

(ix) filtering said analog form in filter means to produce an analog output representative of a portion of said signal, and

(x) repeating steps (iii) through (x) to generate said signal.

4,525,796

PIPELINED OPERATION UNIT FOR VECTOR DATA

Koichiro Omoda; Yasuhiro Inagami, both of Hadano; Shunichi Torii, Musashino, and Shigeo Nagashima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,720

Claims priority, application Japan, Feb. 13, 1981, 56-19091

Int. Cl.³ G06F *7/00*

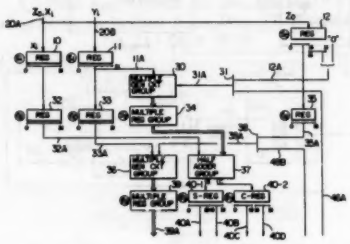
U.S. Cl. 364—730 **12 Claims**

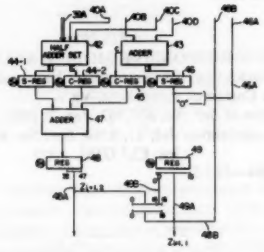
1. An operation unit wherein a plurality of first data, which are sequentially supplied, each undergoes a predetermined operation which involves at least a part of the result obtained by the predetermined operation involving a first data preceding the first data being operated on, said operation unit comprising:

first means connected to receive said first data and second data for performing a first operation on each of said first data involving said second data applied thereto, thereby to produce a first partial data representing a first part of a resultant data obtained as a result of said predetermined operation to each first data on an intermediate data to be used for obtaining a second partial data representing a second part of said resultant data;

second means for performing a second operation on said intermediate data thereby to produce said second partial data; and

input means for applying to said first means, as said second data, a first partial data which is obtained by performing





said first operation on one of said first data preceding the first data being operated on, wherein said first means performs said first operation on each first data in parallel with the execution of said second operation by said second means.

4,525,797

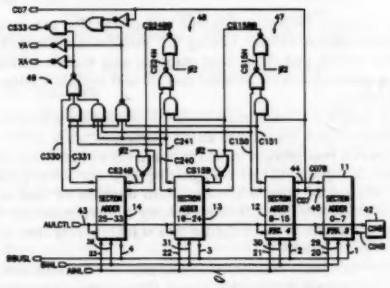
N-BIT CARRY SELECT ADDER CIRCUIT HAVING ONLY ONE FULL ADDER PER BIT

Kirk N. Holden, Lockhart, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1983, Ser. No. 455,091

Int. Cl.³ G06F *7/50*

U.S. Cl. 364—788 **8 Claims**



1. An n-bit adder circuit, where n is an integer, for simultaneously adding n bits of a first and a second number and simultaneously outputting n sum bits and a carry-out bit in response to a control signal, comprising:

a rank ordered plurality of parallel connected section adders, each of said section adders providing a predetermined portion of said n sum bits and comprising:

a rank ordered plurality of full adder circuits, wherein the n-bit adder circuit comprises only n full adders and each bit of said n sum bits is provided by only one full adder circuit,

each full adder circuit of the section adder of lowest rank having a first input for receiving a predetermined bit of said first number, a second input for receiving a predetermined bit of said second number, a carry-in input terminal, the carry-in input terminal of the lowest ranked full adder being adapted for receiving an input carry-in bit, a carry-out output terminal, the carry-out output terminal of each full adder except the highest ranked being coupled to the carry-in input terminal of the full adder of next higher rank, and an output sum terminal, for providing one of said sum bits in response to a rank order sum select bit;

each full adder circuit of the remaining section adders having a first input for receiving a predetermined bit of said first number, a second input for receiving a predetermined bit of said second number, first and second carry-in input terminals for respectively receiving the carry-out bit and complement thereof of the highest ranked full adder of the next lower ranked section adder, and first and second carry-out output terminals corresponding respectively to carry-out bits of zero and one, all full adders of the remaining section adders and of rank greater than the lowest rank having third and fourth carry-in input terminals coupled to the first and second carry-out bit terminals of the full adder of immediately lower rank; and

a rank ordered plurality of carry sum select logic means, for providing said rank ordered sum select bits associated with the sum of the first and second input numbers, the lowest ranked carry sum select logic means having an input coupled to the carry-out output terminal of the highest ranked full adder of the next to lowest ranked section adder and an output coupled to the first and second carry-in input terminals of the lowest ranked full adder of the next higher ranked section adder, the highest ranked carry sum select logic means having an input coupled to the carry-out terminals of the highest ranked full adder of all section adders and an output for providing the carry-out bit, and the remainder of the rank ordered carry sum select logic means each having an input coupled to the carry-out output terminals of the highest ranked full adders of predetermined section adders and an output coupled to a carry-in input terminal of the lowest ranked full adder of a predetermined section adder.

4,525,798

APPARATUS FOR PERFORMING A HADAMARD TRANSFORMATION

Jean-Claude Rebourg, 95, Avenue de la Clairiére, 78120 Rambouillet, and Claude Despois, 2, Impasse du Domaine Premay en Yvelines, 78660 Ablis, both of France

Filed Jul. 28, 1982, Ser. No. 402,569

Claims priority, application France, Aug. 3, 1981, 81 15034

Int. Cl.³ G06G *7/12*; H03H *15/02*

U.S. Cl. 364—826 **12 Claims**

1. An apparatus for performing a Hadamard transformation, comprising:

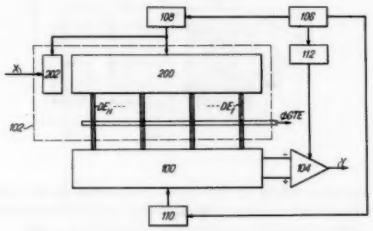
(a) a first input circuit having an input receiving an input signal and having an output delivering sequences of N input samples (X_1, X_2 . . . X_N), at a sample frequency;

(b) a first auxiliary charge transfer device with at least N work electrodes in line (E_1, E_2 . . . E_N), said first auxiliary charge transfer device being realized on a semiconductor substrate having a particular doping type and being connected to said first input circuit, and being provided with means for controlling the transfer from one electrode to the next, with a frequency equal to said sample frequency;

(c) a first set of N diffusion bands (DE_1, DE_2 . . . DE_N) disposed in said semiconductor substrate and having a doping type opposite to that of said substrate, each diffusion band having first and second extremities, said first extremity being connected to one of said work electrodes of said auxiliary charge transfer device;

(d) a first set of N transfer grids (GTE_1, GTE_2 . . . GTE_N) disposed on said N diffusion bands, said transfer grids being connected to a connection raised to a potential (ϕGTS);

(e) a calculation charge transfer device for performing said Hadamard transformation, said calculation charge transfer device having a plurality of electrodes arranged in a line and comprising a first set of N introduction electrodes, a second set of N extraction electrodes, a third set of reading electrodes, said N introduction electrodes



being connected to said second extremity of said N diffusion bands, said calculation charge transfer device comprising further control means for transferring charges from one electrode to the next, with a frequency equal to said sampling frequency;

(f) a differential charge reader comprising a differential amplifier with two inputs, one input being a reversing input and the other input being a nonreversing input, said reversing input being connected to a first group of electrodes belonging to said third set of reading electrodes, said first group of electrodes being set to have a sign −, said nonreversing input being connected to a second group of electrodes belonging to said third set of reading electrodes, said second group of electrodes being set to have a sign +, said reader further comprising sampling means at said sampling frequency and having an output supplying output samples which are transformed samples of said input samples by said Hadamard transformation.

4,525,799

ELECTRONIC CASH REGISTER

Tamotsu Okawa, Nagaokakyo, and Hiromi Yuasa, Muko; both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 9, 1981, Ser. No. 242,147

Claims priority, application Japan, Mar. 26, 1980, 55-39312

Int. Cl.³ G06F *15/02*

U.S. Cl. 364—900 **11 Claims**

1. An electronic cash register, comprising:

memory means having a plurality of registering regions, each registering region allotted for a commodity department,

each said registering region including a specifying information storing portion, each said specifying information storing portion representing that, when specifying information is loaded therein, the corresponding registering region is capable of registering information,

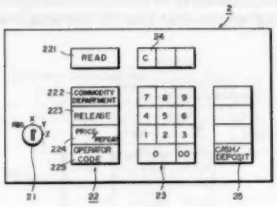
each said commodity department being allotted a corresponding commodity department code for individually identifying the same,

entry means for entering a first commodity department code and a last commodity department code of a series of consecutive commodity department codes, the series being greater than two in number, in case where said series of consecutive commodity department codes are allotted for a plurality of commodity departments which need be made registrable,

first code storing means for storing said first commodity department code entered by said entry means,

second code storing means for storing said last commodity department code entered by said entry means,

region designating means responsive to said commodity department codes stored in said first and second code storing means for designating in succession said registering regions associated with the commodity departments



corresponding to the respective consecutive commodity department codes from said first commodity department code to said last commodity department code,

write enabling means for enabling writing of said specifying information in said specifying information storing portion, and

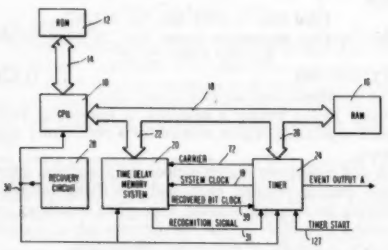
writing means responsive to enabling by said write enabling means for writing said specifying information in said specifying information storing portion of said registering region designated by said region designating means, whereby when an operator wishes to register new or change or output information stored in the registering regions corresponding to the series, the operator only needs to enter the first and last commodity department codes to designate which registering regions are to be accessed.

4,525,800

ENHANCED RELIABILITY DATA STORAGE SYSTEM WITH SECOND MEMORY FOR PRESERVING TIME-DEPENDENT PROGRESSIVELY UPDATED DATA FROM DESTRUCTIVE TRANSIENT CONDITIONS

Donald R. Hamerla, King of Prussia, Pa., assignor to General Electric Co., Philadelphia, Pa.

Filed Jun. 1, 1981, Ser. No. 269,102
Int. Cl.³ G06F *13/02*
U.S. Cl. 364—900 **10 Claims**



8. Apparatus for preserving the integrity of time-dependent, periodically performed, critical calculations from destruction by the adverse effects produced by an externally originated transient condition of approximately known maximum duration, comprising:

(a) a first storage means for holding critical information, said critical information including a time reference and time-dependent values;

(b) means for collecting said critical information from said first storage means;

(c) a second storage means substantially immune to said adverse effects and including an input and an output, said second storage means being adapted to accept said critical information at said input and to reproduce said critical information at said output after a predetermined delay interval;

(d) means for entering said collected critical information in the form of successive critical information frames into said second storage means;

(e) sensing means responsive to the onset of a transient condition to switch said apparatus to a recovery mode;

(f) means for loading said critical information from said second storage means into said first storage means after termination of said adverse effects during said recovery mode; and

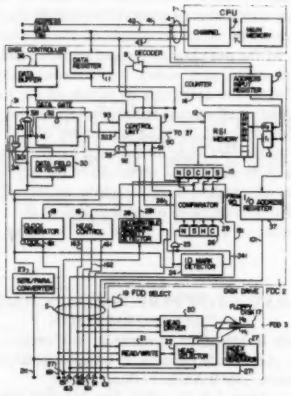
(g) means for compensating the time reference and the time-dependent values of said critical information for said predetermined delay interval imposed by said second storage means.

4,525,801

DISK STORAGE CONTROLLER

Shigeyuki Kuwabara, Isehara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,819
Claims priority, application Japan, Dec. 19, 1980, 55-178893
Int. Cl.³ G06F *3/06*
U.S. Cl. 364—900 **8 Claims**



1. A controller for controlling access to information recorded on a disk recording medium in a disk storage from an upper hierarchy device, comprising:

receiving means for receiving recording status information from said upper hierarchy device, said recording status information indicating one of a plurality of different types of recording parameters of said information as recorded on said recording medium;

circuit means responsive to recording status information and commands from said upper hierarchy device as received by said receiving means for controlling said disk storage in accordance with the recording parameter indicated by

said recording status information on said recording medium to effect read and write operations on said disk recording medium; and

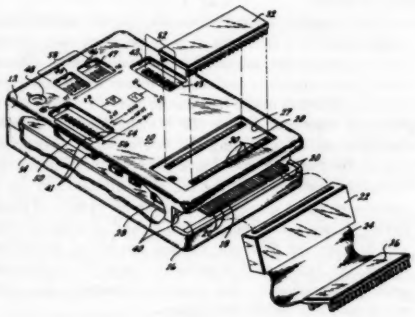
means coupled between said receiving means and said circuit means for controlling the operation of said circuit means so that the read and write operations thereof are compatible with one of said plurality of different types of recording parameters based on said recording status information received by said receiving means.

4,525,802

PORTABLE ELECTRONIC TESTING APPARATUS

Paul Hackamack, Torrance, Calif., assignor to Cache Technology Corporation, Valencia, Calif.

Filed May 14, 1982, Ser. No. 378,185
Int. Cl.[3] G01R 15/12
U.S. Cl. 364—900 19 Claims



1. A portable electronic testing apparatus for examining data present at a selected address during the operation of a microprocessor system and with the microprocessor system including a receptacle for receiving a CPU and with both the receptacle and CPU having the same particular electrical connections, the testing apparatus including,

an electrical socket having the same particular electrical connections for receiving the CPU and providing electrical contact to the CPU when the CPU is removed from the microprocessor system and plugged into the electrical socket,

a connector assembly interconnected with the electrical socket, the connection assembly including a plug simulating the electrical connections of the CPU and with the plug for plugging into the receptacle included in the microprocessor system after the CPU is removed from the microprocessor system so as to electrically reconnect the CPU within the operation of the microprocessor system,

address selection means for providing a selection of the address of data to be examined,

comparator means coupled to the electrical socket and thereby to the CPU when the CPU is removed from the microprocessor system and plugged into the electrical socket and also coupled to the address selection means for comparing the address of the data within the microprocessor system with the selected address of the data to be examined and for producing a signal in accordance with a match between the compared addresses,

display means coupled to the electrical socket and thereby to the CPU when the CPU is removed from the microprocessor system and plugged into the electrical socket and responsive to the signal from the comparator means for displaying the data at the selected address within the microprocessor system, and

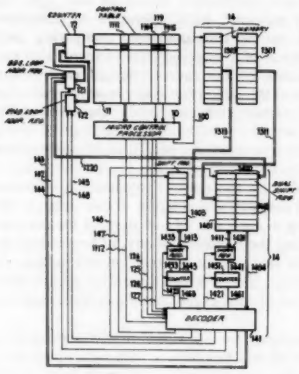
read/write selection means for providing a selection of data written to and/or read from the CPU at the selected address.

4,525,803

METHOD FOR CONTROLLING THE COMPARISON TO BE EFFECTED BETWEEN REFERENCE LOGICAL ENTITIES AND LOGICAL ENTITIES ISSUING FROM A FILE

Jacques Vidalin, Montpellier, and Jean L. Aucouturier, Gradignan, both of France, assignors to L'Universite de Bordeaux 1, Talence, France

Filed Aug. 12, 1982, Ser. No. 407,360
Int. Cl.[3] G06F 7/06, 7/22, 13/00
U.S. Cl. 364—900 3 Claims



1. A method for processing information received from a file which includes data elements of different types, each data element consisting of a fixed or variable number of items of information, each item of information in a given data element having a different respective order, data elements of a first type being arranged in sequences which are identified by a data element of a second type, said method comprising the steps of:

(A) storing reference data elements in a table logically divided into horizontal zones and vertical columns, each horizontal zones storing one or more reference data elements which are of a same said type and which are to be simultaneously compared to a data element received from the file such that each said horizontal zone is associated with reference data elements of a respective type, each reference data element consisting of a fixed or variable number of items of information, each item of information in a given reference data element having a different respective order, each reference data element being stored vertically in a respective vertical column of the horizontal zone in which it is located with each item of information of that reference data element being located in a respective line of that vertical column, and the vertical order of said horizontal zones following the order in which the data elements of types corresponding to said zones appear in said file;

(B) storing control information in a control memory which is logically divided into a plurality of lines, each line of said memory containing:

(1) first items of control information including: comparison control information identifying the type of comparison to be made between data elements of a same type received from said file and reference data elements of this type stored in a horizontal zone of said table, which zone corresponds to the line of the memory wherein said comparison control information is stored; and storage control information relating to the storage of the data elements received from said file; and

(2) second items of control information identifying operations to be carried out when a comparison operation is completed between one or more data elements received from the file and one or more corresponding reference

data elements in said table, said second items of control information including jump control information identifying the next line in said control memory and/or the next horizontal zone in said table which is to be jumped to;

(C) sequentially receiving items of information from said file;

(D) executing the operations of comparison and/or storage identified by the first items of control information stored in a first line of said control memory, jumping to the next line of said control memory identified by the jump control information stored in said first line of said control memory and then executing the operations identified by the items of control information stored in said next line of said control memory, each operation of comparison being carried out by simultaneously comparing each item of information of a received data element with each item of information of the same order of each reference data element of the same type as the received data element, said step of executing operations of comparison and/or storage being carried out without interrupting the receipt of data elements from said file, each item of information received from the file initializing the execution of the operations controlled by the control information contained in said control memory and relating to this item of information;

(E) storing in each line of said control memory a data field specifying the existence, if any, of beginnings and ends of loops for said item of information and linkage instructions for linkings, if any, to be effected on said control memory at the end of each execution of a control memory processing;

(F) memorizing, for each line of said control memory: the number of said beginnings and ends of loops to be executed; the restart address for each loop; and the jump address to the consecutive processing on the control table;

(G) counting the number of beginning of loop operations associated with the execution of each control line instruction;

(H) counting the number of end of loop operations associated with the execution of each control line instruction;

(I) comparing the result of said counting steps with said data field; and

(J) determining, depending on the result of said comparing and on instructions contained in the same line of said control memory, whether to continue looping at the same loop or restart operation at an immediate outer loop or jump to another control table location to execute instructions corresponding to consecutive processing.

4,525,804

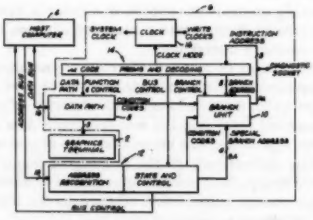
INTERFACE APPARATUS FOR HOST COMPUTER AND GRAPHICS TERMINAL

John E. Mosier, Tulsa; Jim B. Surjaatmadja, Duncan; George B. McLawhon, Tulsa, all of Okla., and Jeffrey M. Gallup, Berkeley, Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 22, 1982, Ser. No. 436,128

Int. Cl.³ G06F *5/06, 5/02*

U.S. Cl. 364—900 **7 Claims**



3. An apparatus for interfacing a host computer, having means for generating parallel electrical signals representing control characters and representing display illumination information defined by a twelve-bit X coordinate and a twelve-bit Y coordinate and having a parallel output means including a Unibus data transferal system for outputting the twelve-bit X and Y coordinates, with a graphics terminal, having a serial input means for receiving display illumination information defined by five seven-bit bytes, said apparatus comprising:

parallel receiver means, directly connected to the Unibus data transferal system, for receiving the parallel electrical signals provided by the host computer through the parallel output means;

serial transmission means for sending serial electrical signals from said apparatus to the graphics terminal;

storage means for providing an addressable memory within said apparatus;

control means, responsive to the control characters defined within the parallel electrical signals, for operating said apparatus in either a first mode or a second mode, said control means including:

low-speed transferal means for transferring the parallel electrical signals at a first rate directly between said parallel receiver means and said serial transmission means without storing such signals in said storage means when said apparatus is operating in the first mode; and

high-speed transferal means for transferring the parallel electrical signals including the twelve-bit X coordinate and the twelve-bit Y coordinate to said storage means and for subsequently converting the X coordinate and the Y coordinate into a group of five seven-bit bytes and transferring to said serial transmission means, at a second rate greater than the first rate of said low-speed transferral means, the group of five seven-bit bytes for high-speed serial transmission to the graphics terminal, said high-speed transferal means including:

first multiplexer means, having a first input channel connected to said storage means for receiving a first group of bits within either the X coordinate or the Y coordinate from said storage means, a second input channel connected to said storage means for receiving a second group of bits of the X coordinate or the Y coordinate from said storage means, and a first output channel, for selectively connecting either said first input channel or said second input channel to said first output channel, said first output channel providing a first multiplexer byte of a multiplexer word of information, said first multiplexer byte comprising a selected one of said first and second group of bits;

second multiplexer means, having a third input channel connected to said storage means for receiving said second group of bits of the X coordinate or the Y coordinate from said storage means, a fourth input channel connected to said storage means for receiving said first group of bits of the X coordinate or the Y coordinate from said storage means, and a second output channel, for selectively connecting either said third input channel or said fourth input channel to said second output channel, said second output channel providing a second multiplexer byte of said multiplexer word of information, said second multiplexer byte comprising a selected one of said second and first group of bits; and

electronic register, arithmetic and logic means connected to said first and second output channels for receiving said multiplexer words and for converting those multiplexer words containing binary bits defining the X coordinate and the Y coordinate into five seven-bit bytes of information to be received by the graphics terminal; and

internal bus means for connecting said parallel receiver means, said serial transmission means, said storage means, and said control means.

4,525,805

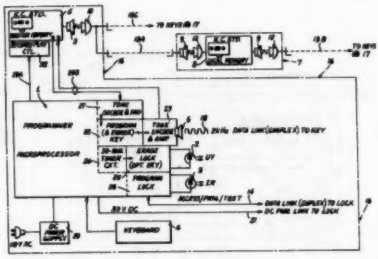
SECURE LOCKING SYSTEM EMPLOYING RADIANT ENERGY AND ELECTRICAL DATA TRANSMISSION

Richard Prosan, 9970 SW. 11 Ter., Miami, Fla. 33174; James M. Hair, III, P.O. Box 141, Moffett Field, Calif. 94035, and Donald A. Sheppard, 9631 SW. 77th St., Miami, Fla. 33173

Filed Dec. 20, 1982, Ser. No. 451,345

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—900 **8 Claims**



1. An improved security system for use in mobile commerce consisting of an electromechanical lock and electronic key and an integrated program-erase procedure whereby overall systemic complexity and security are increased through the use of electromagnetic wavelengths to erase and reprogram volatile lock memories, comprising:

a computing means located at a first location for programming said lock means and said key means using a first electromagnetic radiating means for programming said lock means with a cipher code and using accoustical wave generating means for programming said key means with a corresponding cipher code;

said computing means also having a second electromagnetic radiating means for erasing said lock means cipher code;

a reprogrammable key means having an accoustical wave receiving microphone and electronic memory storing means for receiving and storing cipher data from the computing means to operate said lock means; and

an accoustical speaker means located at said first location and connected to said computing means for communicating with said microphone on said key means when said key means is at a second location remote from said first location wherein said key means can be programmed to operate said lock means when said lock means is located at said second location and wherein the cipher code can be changed by the computing means only at said first location.

4,525,806

PRINTER SHARING BY PLURALITY OF DISPLAY UNITS IN WORD PROCESSING SYSTEM

Johnny G. Barnes, Austin; John A. Hooten, Round Rock; Patrick J. Hurley, Austin, and Ernest L. Miller, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 247,969, Mar. 26, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,618

Int. Cl.³ G06F *3/12, 15/16*

U.S. Cl. 364—900 **6 Claims**

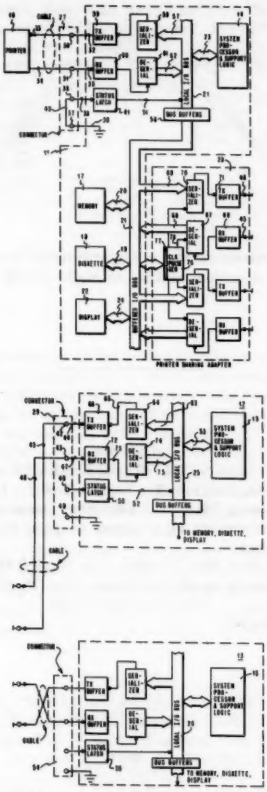
1. In a work processing system comprising a printer and a primary display unit having a text formatting processor, means for displaying text and means for controlling said printer to print formatted text, the improvement wherein said primary display unit comprises

means connected to said printer for controlling the sharing of said printer by said primary display unit and at least one other display unit,

said at least one other display unit having a text formatting processor and means for displaying text and means for controlling the sharing of said printer and means for controlling said printer to print formatted text,

said printer sharing control means in said primary display unit being inactive in the absence of another display unit connected to said primary display unit,

means for selectively connecting said primary display unit to said at least one other display unit, and



means responsive to said connection for activating said printer sharing control means in said primary display unit whereby said other display unit communicates with said printer through said printer sharing control means, thereby sending formatted text to said printer via said printer sharing control means.

4,525,807

MAGNETIC BUBBLE STORE WITH NON-IMPLANTED MOTIFS AND METHOD FOR CONTROLLING THE SAME

Hubert Jouve, Biviers, and Joël Magnin, Saint-Martin d'Hères, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 17, 1984, Ser. No. 571,484

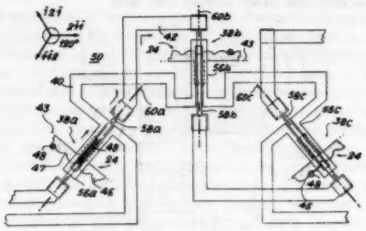
Claims priority, application France, Jan. 20, 1983, 83 00866

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—36 **26 Claims**

1. A magnetic bubble store, using adjoining non-implanted motifs as bubble-propagating motifs, wherein the store comprises 3n identical, electrically interconnected storage devices, n being a positive integer, which are produced on an identical circuit chip and each comprise minor loops for storing the bubbles, at least one major loop acting as an access loop for the minor loops, first electrical means enabling bubbles to be transferred from the minor loops to the major loop and vice versa, a second electrical means enabling bubbles to be produced on

the major loop, and a third electrical means enabling the bubbles on the major loop to be detected, the third, identical means, each formed by an electric conductor for bubble extension and contraction and a magneto-resistive element, being disposed in directions making an angle of 120° with one another.



4,525,808

HYBRID MAGNETIC BUBBLE MEMORY DEVICE

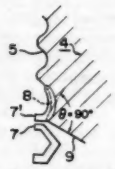
Naoki Kodama, Hachioji; Ryo Suzuki, Kodaira; Teruaki Takeuchi, Kokubunji; Masatoshi Takeshita, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,954

Claims priority, application Japan, Mar. 25, 1983, 58-48958

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—36 **2 Claims**



1. A hybrid magnetic bubble memory device including first and second magnetic bubble propagation track means in such a manner that said first magnetic bubble propagation track means is formed of a portion of the boundary between first and second regions of a magnetic medium film having uniaxial anisotropy and adapted to be applied with a magnetic field in a direction perpendicular to said magnetic medium film to generate a magnetic bubble therein, said boundary is produced by implanting said first region with ions under ion-implant conditions different form those for said second region, and said second magnetic bubble propagation track means is formed of a soft magnetic material film on said magnetic medium film and connected with said first magnetic bubble propagation track, wherein said boundary between said first region and said second region is bent at a junction for transferring a magnetic bubble from said second magnetic bubble propagation track means to said first magnetic bubble propagation track means, to divide said boundary into a boundary portion for propagating a magnetic bubble and another boundary portion foreign to magnetic bubble propagation, and an angle between said two boundary portions at the bend in said boundary is put in a range from 45 to 180 degrees.

4,525,809

INTEGRATED CIRCUIT

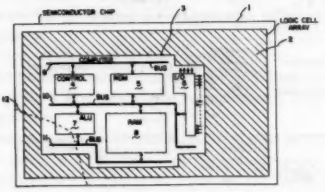
Fumitaka Chiba, and Kyozo Shimizu, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 342,935, Jan. 26, 1982,. This application Aug. 27, 1984, Ser. No. 644,664

Claims priority, application Japan, Jan. 26, 1981, 56/9992

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—51 **4 Claims**

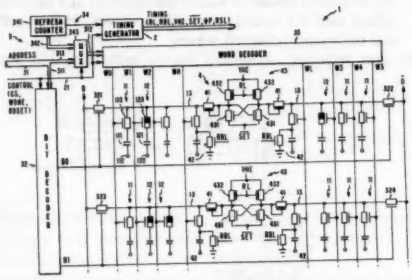


1. An integrated semiconductor circuit comprising a semiconductor substrate having first to fourth edges; a first surface area including a first portion extending along said first edge of said substrate, a second portion extending along said second edge of said substrate, and a third portion extending along said third edge of said substrate; a second surface area having at least first, second and third sides respectively making contact with said first, second and third portions of said first surface area; said first portion of said first surface area lying between said first edge of said substrate and said first side of said second surface area, said second portion of said first surface area lying between said second edge of said substrate and said second side of said second surface area, said third portion of said first surface area lying between said third edge of said substrate and said third side of said second surface area; a computer function block formed on said second surface area of said substrate, said computer function block including in a fixed positional relationship a read only memory on said second surface area, a random access memory on said second surface area, an arithmetic logic unit on said second surface area, a peripheral input-/output circuit on said second surface area, a first bus running adjacent to and along said first side of said second surface area, and a second bus running adjacent to and along said third side of said second surface area; each of said random access memory, said arithmetic logic unit and said peripheral input/output circuit having a plurality of wirings arranged in fixed patterns; a first group of logic unit cells formed on said first portion of said first surface area; a second group of logic unit cells formed on said second portion of said first surface area; a third group of logic unit cells formed on said third portion of said first surface area; first discretionary wirings having arbitrary patterns for arbitrarily interconnecting selected ones of said first, second and third groups of logic unit cells to performed arbitrary logic functions; second discretionary wirings having arbitrary patterns for connecting the selected logic unit cells in said first group of logic unit cells to said first bus of said computer function block; and third discretionary wirings having arbitrary patterns for connecting the selected logic unit cells in said third group of logic unit cells to said second bus of said computer function block; whereby said selected logic unit cells form an additional peripheral circuit or an expanded interface circuit for said computer function block.

4,525,810
SEMICONDUCTOR MEMORY CAPABLE OF BOTH READ/WRITE AND READ-ONLY OPERATION

William H. Cochran, and Philip T. Wu, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 173,240, Jul. 28, 1980, abandoned. This application May 9, 1983, Ser. No. 492,976
Int. Cl.³ G11C *11/24*
U.S. Cl. 365—102 13 Claims



1. A method of accessing fixed data contained in a combined read-only and read/write memory having an array of addressable storage cells each having an FET and a storage element, a first plurality of said FETs being physically constructed so as to have a first threshold voltage and a second plurality of said FETs being physically constructed so as to have a second threshold voltage different from said first threshold voltage, comprising the steps of:

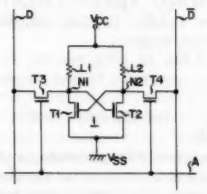
(a) first, accessing each of said cells with a voltage level capable of loading a first of two different data voltages into the storage element of each of said storage cells in said first plurality and a second of said data voltages into the storage element of each of said storage cells in said second plurality;

(b) thereafter, selecting one of said storage cells so as to transfer the data voltage stored in its storage element to an output data line.

4,525,811
SEMICONDUCTOR MEMORY AND METHOD OF PRODUCING THE SAME

Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 29, 1982, Ser. No. 344,047
Claims priority, application Japan, Feb. 6, 1981, 56/16651
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 5 Claims

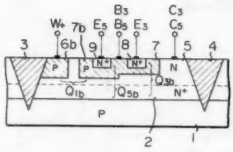


1. An integrated static RAM, comprising a flip-flop circuit constituting a memory cell, a MOS transistor for selecting the memory cell, and a peripheral circuit formed in a substrate in which is formed a memory matrix, wherein the gate oxide film of the MOS transistor for selecting the memory cell is thicker than the gate oxide film of the MOS transistor included in the peripheral circuit.

4,525,812
SEMICONDUCTOR MEMORY DEVICE

Kazuhiro Toyoda, Yokohama, and Chikai Ono, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 18, 1982, Ser. No. 442,755
Claims priority, application Japan, Nov. 20, 1981, 56-185460
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—155 7 Claims



1. A semiconductor memory device having word lines and having bit lines intersecting the word lines, comprising:

a memory cell array having memory cells operatively connected at the intersections of the word lines and bit lines, each of said memory cells comprising:

two PNPN cells cross-coupled with each other, each PNPN cell comprising a load transistor and a multi-emitter transistor operatively connected to said load transistor, said multi-emitter transistor comprising:

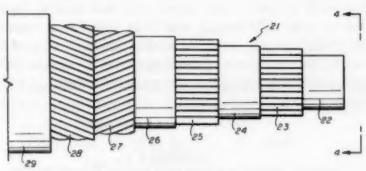
a data holding transistor; and

a read/write transistor operatively connected to said data holding transistor, said read/write transistor having a current amplification factor and having means for decreasing the current amplification factor when said read/write transistor operates inveresely.

4,525,813
ARMORED UMBILICAL APPARATUS FOR TOWING A MARINE SEISMIC AIR GUN SUB-ARRAY

Eric C. Burrage, P.O. Box 581, Pearland, Tex. 77581

Filed Jan. 21, 1982, Ser. No. 342,510
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—20 7 Claims



5. An armored umbilical apparatus for towing a sub-array of a plurality of marine seismic air guns comprising:

a central air hose;

a first plurality of electrical control cables disposed concentrically around said central air hose;

a protective wrapping disposed around said first plurality of electrical control cables;

a second plurality of electrical control cables disposed concentrically around said protective wrapping;

a first protective coating disposed over said second plurality of electrical control cables;

a first stress member comprised of a plurality of high tensile strength steel wires spirally wrapped around said first protective coating;

a second stress member comprised of a plurality of high

tensile strength steel wires spirally wrapped around said first stress member;

flotation means disposed over said second stress member;

a termination housing attached to one end of said armored umbilical for receiving said central air hose and said first and second plurality of electrical control cables.

4,525,814

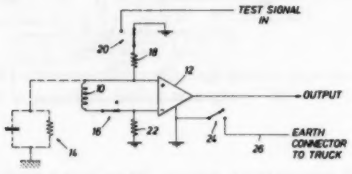
LEAKAGE TESTING CABLE CONNECTOR NETWORK

James C. Woodall, Houston, Tex., assignor to Mark Products Incorporated, Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,541

Int. Cl.³ G01V *1/38*; G01R *27/26, 31/08*

U.S. Cl. 367—20 **7 Claims**



1. Apparatus for determining the presence of leakage at each of a plurality of data units in a data transmission system having sequentially connected data units cable-connected to a control station, comprising at each of said data units

an electronic data transmission network including a differential amplifier connected to receive a local data signal across its input terminals whose full amplitude value is at least partially decreased in the presence of a leakage connection to earth, said network being connected to electrical circuit common,

an input voltage divider element connected to a first of the input terminals of said differential amplifier for receiving a test voltage,

a complementary voltage divider element connected to the second input terminal of said differential amplifier and connected to the electrical circuit common for the data unit,

a connecting earth conductor from the electrical circuit common to said control station for connecting to the electrical circuit common at said control station, the control station electrical circuit common being connected to earth, and

switch means at said data unit for opening the connection between the local data signal and said second input terminal of said differential amplifier and for connecting the electrical circuit common at said data unit to said connecting earth conductor, the output level from said differential amplifier indicating the presence of a leakage connection to earth.

4,525,815

WELL PIPE PERFORATION DETECTOR

W. Keith R. Watson, P.O. Box 1537, Rancho Sante Fe, Calif. 92067

Filed Feb. 9, 1982, Ser. No. 347,164

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—35 **17 Claims**

1. In apparatus to detect a discontinuity indicative of a hole in the bore wall of an axially extending tubular member, the combination comprising

(a) a carrier adapted to be traveled axially lengthwise in the bore of said member,

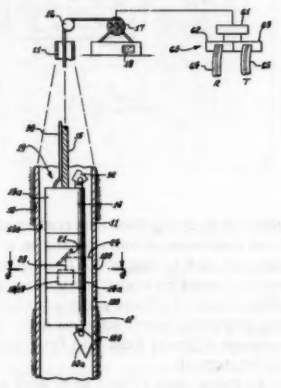
(b) acoustical wave transmitting means located on the carrier to transmit acoustical waves for travel toward the bore wall and reflection therefrom,

(c) acoustical wave detector means at least partially located on the carrier to receive acoustical waves reflected from the bore wall and to detect the presence or absence of such reflected waves, and

(d) control means for providing an indication of said discontinuity, and including means for controlling the transmission to the detector means of said reflected acoustical waves and characterized in that the detector means is controllably exposed to reception of a sequential succession of reflected acoustical waves corresponding to a sequential succession of bore wall portions from which the waves are reflected,

(e) said control means including an acoustical wave reflector, and drive means to rotate the reflector at a location to reflect said (b) means transmitted waves, and to reflect said (c) means reflected waves,

(f) said reflected acoustical waves including first waves



indicative of the absence of a hole in said bore wall, and second waves indicative of the presence of a hole in said bore wall, and wherein said control means includes circuitry to produce attenuated signal versions of said first waves and amplified signal versions of said second waves,

(g) said circuitry including sampling means to provide a selected number of samples of the received signal, per revolution of the reflector, and a processor to receive said samples and to combine them with averaged values of selected time delayed sample values, thereby to derive substantially no output when no discontinuities are detected, and positive outputs when discontinuities are detected,

(h) said circuitry including means to receive said samples and process same to derive an azimuthal indication of the location of the detected discontinuity.

4,525,816

SONAR ARRANGEMENTS

Paul A. Crowther, London, England, assignor to The Marconi Company Limited, England

Filed Sep. 23, 1982, Ser. No. 421,960

Claims priority, application United Kingdom, Sep. 25, 1981, 8129090

Int. Cl.³ G01S *3/82*

U.S. Cl. 367—123 **6 Claims**

1. A sonar arrangement for generating a rotation directional response beam to an incoming sonar signal comprising:

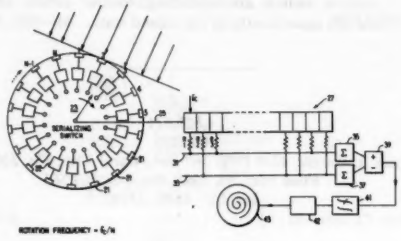
(a) a circular array of electroacoustic transducers each of which generates an individual electric signal,

(b) means for sequentially sampling the signals from said transducers

(c) clocking means for quantising the signal samples and producing digital representations thereof, and

(d) a shift register arranged to be fed sequentially with digi-

tal representations of said signal samples, said shift register being provided with sufficient stages to receive a plurality of cycles of signal samples and being tapped at a predetermined selection of stages with individual positive and negative tap weightings of appropriate magnitude to provide phase compensation of said incoming sonar signal at



those transducers whose signal samples instantaneously occupy said predetermined selection of stages over a plurality of cycles of signal samples, and

(e) summing means to sum the weighted output signals from said tapped stages and thereby generate said rotating directional response beam.

4,525,817

ACOUSTIC RESISTOR IN AN ELECTROACOUSTIC TRANSDUCER

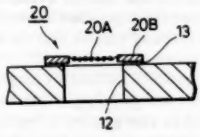
Suzuki Takuya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 16, 1983, Ser. No. 523,719

Claims priority, application Japan, Aug. 27, 1982, 57-149002; Aug. 27, 1982, 57-149003

Int. Cl.³ G01V *1/00*; H04R *1/28*

U.S. Cl. 367—140 **10 Claims**



5. An acoustic resistor provided on an electroacoustic transducer to cover each of tone apertures formed in said electroacoustic transducer, said acoustic resistor being formed of a mesh member having an acoustic resistance characteristic and comprising an acoustically resistant portion corresponding to said tone aperture and an acoustically opaque portion surrounding said acoustically resistant portion, said acoustically opaque portion being secured rigidly to the peripheral portion of said tone aperture, and an acoustic resistance component determined by said acoustically resistant portion of the mesh member being imparted to a tone aperture portion of said transducer.

4,525,818

STABLE FIBER-OPTIC HYDROPHONE

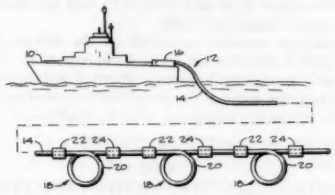
Paolo G. Cielo, and Garfield W. McMahon, both of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Continuation of Ser. No. 89,635, Oct. 29, 1979, abandoned. This application Jul. 28, 1982, Ser. No. 402,808

Claims priority, application Canada, Aug. 9, 1979, 333603

Int. Cl.³ H04B *13/00*

U.S. Cl. 367—149 **17 Claims**



1. An optical fiber hydrophone system adapted to process variations in local acoustical pressure in a fluid body and provide an identifiable output signal, comprising:

signal source and detecting means for providing an optical signal in a selected form, and for detecting and extracting said indentifiable output signal;

a single optical fiber connected at one end to said source and detecting means and operable for conducting optical signals from said source and to said detecting means;

a sensing means in said optical fiber remote from said source and detecting means, said sensing means being adapted for immersion in said body and including two optical reflector means incorporated into said fiber and spaced one from the other by a predetermined length of said optical fiber, at least one of said reflector means being partially reflective and partially transmissive, said variations in acoustical pressure incident on said sensing portion causing a change in said predetermined length thereof and thus a phase and intensity modulation in the portion of said optical signal reflected back and forth between said two optical reflector means and,

means connected to said source and detecting means for processing the intensity modulated optical signal transmitted back to said source and detecting means in said optical fiber for extraction therefrom of said identifiable output signal.

4,525,819

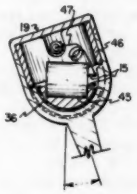
HORIZONTAL GEOPHONE TRANSDUCER ASSEMBLY

Fred W. Hefer, Houston, Tex., assignor to Oyo Corporation, U.S.A., Houston, Tex.

Filed Dec. 6, 1982, Ser. No. 447,095

Int. Cl.³ H04R *9/00*

U.S. Cl. 367—188 **3 Claims**



1. A seismic transducer comprising in combination:

a rigid casing having a gimbal chamber defining a bottom

wall and means for coupling the casing to the ground to pick up the vibrations thereof;

a horizontal geophone having a pair of terminals being disposed inside said chamber;

a leader cable extending though the casing and means connecting the geophone terminals to said leader cable; and

gimbal means positioned inside the casing chamber and adapted to maintain said horizontal geophone in a horizontal plane for within a predetermined tilt angle range of said casing relative to the vertical, said gimbal means being a medium partially filling said gimbal cavity and being adapted to support said geophone and to transmit vibrations from said ground to said geophone; and said gimbal means including:

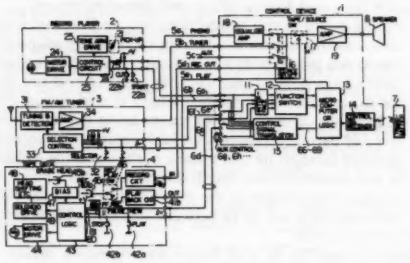
a carriage movably mounded on the bottom wall of said gimbal chamber for limited movement in one direction only in response to an angular tilt of said casing to thereby cause the angle of the geophone's vertical axis to become in substantial alignment with the horizontal.

4,525,820

FUNCTION SELECTING METHOD AND SYSTEM FOR AN AUDIO/VIDEO RECORDING AND REPRODUCING SYSTEM

Takashi Enoki; Hiroaki Nakamura, both of Toyokawa, and Fujio Nakashima, Aichi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,512
Claims priority, application Japan, Mar. 19, 1980, 55-33867
Int. Cl.[3] G11B *31/00*; H04N *5/76*
U.S. Cl. 369—2 **7 Claims**



1. A function selection apparatus for selecting a function of an audio/video recording/reproducing system comprising:

a plurality of signal sources;

a control device including a selection circuit having a plurality of function select switches for selecting any one of the plurality of signal sources, said function select switches being disposed in respective signal transmission lines, a plurality of function switches provided corresponding to said plurality of signal sources, and function control means disposed between said plurality of function switches and said selection circuit responsive to the closure of one of said plurality of function switches for controlling one of said plurality of function selection switches corresponding to the closed function switch so as to select one of said signal sources corresponding to the closed function switch;

an external unit comprising reproducing means forming at least one of said plurality of signal sources, said external unit including therein a motive switch and a control circuit for controlling the operation of said reproducing means corresponding to said motive switch when said motive switch is closed;

first control means provided in said control device and responsive to the closure of said motive switch for controlling a corresponding one of said plurality of function switches to make it equivalently closed;

a control transmission line provided between said external unit and said control means for transmitting a signal indicative of the closure of said motive switch to said control means; and

second control means disposed between said plurality of function switches and said motive switch of the external unit and responsive to the closure of one of said function switches corresponding to said external unit to render the motive switch corresponding to the closed function switch equivalently in the closed state.

4,525,821

CROSS

Juan R. Garcia, 4235 NW. 167 Ter., Carol City, Fla. 33055

Filed Mar. 14, 1984, Ser. No. 589,563
Int. Cl.[3] A47G *33/02*
U.S. Cl. 369—31 **8 Claims**

1. A cross assembly comprising:

(a) a cross and a casing, said cross removably attached to said casing and selectively positionable in supported engagement with said casing and in outwardly extending, upright relation thereto and in overlying substantially parallel position relative thereto,

(b) attachment means comprising a pin element extending outwardly from an outer surface of said casing in perpendicular relation thereto and a key element having a substantially elongated configuration and mounted on said casing in spaced apart and aligned relation to said pin element, wherein a central longitudinal axis of said key element is aligned with a central axis of said pin element,

(c) said attachment means further comprising a first recess located in a distal end of said cross and dimensioned to receive said pin element therein; a track means formed in an under surface of said cross and dimensioned and configured to simultaneously receive said pin element and said key element therein,

(d) said upright position defined by engagement between said pin element and said first recess and said overlying position defined by engagement between said pin element and said key element with said track means,

(e) said casing further comprising a main recess formed in said outer surface thereof and dimensioned to receive a tape recording machine therein, a tape recording machine disposed within said main recess and including operator means structured to operate said machine,

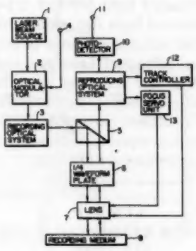
(f) side opening recess means formed in said casing in communicating relation with said main recess and dimensioned to permit passage therethrough of said operator means for manipulation thereof exteriorly of said casing, and

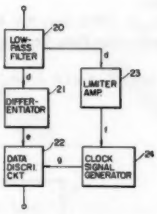
(g) an opening formed in said cross and disposed in overlying relation with said main recess and in substantial registry with a speaker of said tape recording machine.

4,525,822
OPTICAL DATA RECORDATION AND REPRODUCTION SYSTEM

Nobuo Nishimura, Kanagawa, Japan, assignor to Fuji Xerox Company, Limited, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,673
Claims priority, application Japan, May 29, 1981, 56-81280
Int. Cl.³ G11B 7/00
U.S. Cl. 369—44 **11 Claims**





1. An optical data recordation and reproduction system, comprising:

first optical means including modulation means wherein a beam of light from a source is frequency modulated by digital data such that a recording signal is produced corresponding to said digital data having a pulse width equal to at least a signal period, said modulated light impacting upon a photosensitive recording medium to produce discontinuities in said medium which correspond to the data to be recorded;

a second optical means, in which a beam of unmodulated light directed onto said photosensitive medium is received and is converted to an electrical signal; and

an electrical circuit comprising a differentiator in which said electrical signal is differentiated and sampled to uncover said recorded data.

4,525,823
OPTICAL TRACKING SYSTEM

Toshio Sugiyama; Hideo Suenaga, both of Toyokawa, and Yukio Fukui, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 397,973
Claims priority, application Japan, Jul. 22, 1981, 56-113679
Int. Cl.³ G11B 21/10, 7/00
U.S. Cl. 369—44 **12 Claims**

1. An optical tracking system comprising:

a recording medium having information pits located apart from each other;

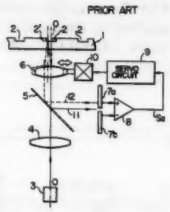
an optical system which projects a light beam from a light source onto said recording medium and collects the reflection ray from said recording medium;

a light sensitive means for detecting said reflection ray; and

a control means which samples the output of said light light sensitive means intermittently and controls said optical system so that said light beam scans the central portions of said information pits, said control means including;

a comparator which generates a trigger signal indicating that

PRIOR ART



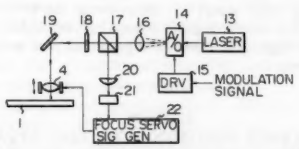
said light beam is scanning a pit in response to said reflection ray with its intensity detected by said light sensitive means lower than a predetermined level, and

a sample holding circuit which samples the output of said light sensitive means in response to said trigger signal.

4,525,824
INFORMATION RECORDING SYSTEM

Hideki Hatano; Norikiyo Tajiri; Sakashi Otaki, and Shigeru Kato, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,241
Claims priority, application Japan, Jun. 4, 1981, 56-086154
Int. Cl.³ G11B 7/00
U.S. Cl. 369—45 **4 Claims**



1. An information recording system utilizing a recording medium having a vertical magnetization film on and from which the information is recorded and played back, respectively comprising:

(a) a source of recording light beam;

(b) a modulator for modulating said recording light beam in accordance with a signal representing the information to be recorded, to form sequences of pulses of said recording light beam which carries said information:

(c) an optical transmission means including a focus lens, for focusing said recording light beam on the surface of the vertical magnetization film;

(d) a focus servomechanism for adjusting the postion of said focus lens in accordance with a control signal;

(e) a bias-beam means for continuously applying a bias beam having a power level which does not change the direction of magnetization of the vertical magnetization film to the surface of the magnetization film; and,

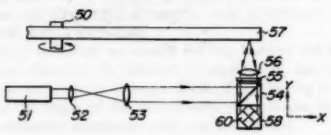
(f) means for producing said control signal based upon the reflection of said bias beam from said magnetization film.

4,525,825

METHOD AND APPARATUS FOR DETECTING FOCUSSING AND TRACKING ERROR SIGNALS

Kenichi Ito; Tohru Musha; Kiichi Kato, and Kimiaki Yamamoto, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Oct. 7, 1981, Ser. No. 309,402
Claims priority, application Japan, Oct. 9, 1980, 55-141174
Int. Cl.³ G11B 7/08
U.S. Cl. 369—45 32 Claims



1. A method for detecting a focussing error signal and a tracking error signal of an objective lens with respect to at least one track direction on a record medium onto which a spot of a light beam is formed by means of said objective lens, each track of said record medium being constituted by crenellated pit construction, having a depth other than an integer multiple of a quarter-wavelength of the light beam, comprising:

focussing the light beam emitted from a light source onto a record medium;

introducing at least a part of a light flux which is reflected from the record medium into an optical member including an optical surface which reflects and/or refracts the incident light flux, said optical member being made of material which has a higher refractive index than that of material into which said light flux enters after being refracted by and transmitted through said optical surface;

detecting at least a part of the light flux reflected by said optical surface by means of a light detector which is arranged in a far field of the track and comprises four divided light receiving regions arranged about an optical axis of the incident light flux; and

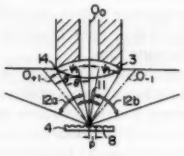
deriving the focussing error signal by detecting a difference between the output signals supplied from two light receiving regions aligned in said track direction and deriving the tracking error signal by determining the difference between the output signals from the two light receiving regions aligned in a direction perpendicular to said track direction.

4,525,826

OPTICAL TRACK POSITION DETECTING APPARATUS AND OPTICAL INFORMATION PROCESSOR USING THE SAME

Shigeru Nakamura, Hachioji; Yoshito Tsunoda, Mitaka; Kazuo Shigematsu, Saitama; Toshimitsu Kaku, Hachioji; Takeshi Maeda, Kokubunji, and Tsuyoshi Kato, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1982, Ser. No. 402,234
Claims priority, application Japan, Sep. 28, 1981, 56-152086
Int. Cl.³ G11B 7/00
U.S. Cl. 369—46 5 Claims



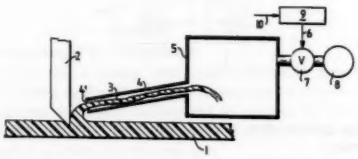
1. An optical track position detecting apparatus comprising a light source, optical means for directing a light flux from said light source to a track on a predetermined recording plane as a focused spot through an optical focusing element, a light detector for detecting a reflected light flux from said track and detection means for detecting a deviation between said focused spot and said track on the basis of an output signal from said light detector, wherein said light detector has at least two light receiving parts arranged symmetrically with respect to a direction of said track, and said light receiving parts detect only changes in light intensity due to respective interferences between a 0-order diffracted light ray and ±1-order diffracted light rays in said reflected light flux, said light receiving parts being disposed within reduced portions of respective overlap areas of the 0-order diffracted light ray and the ±1-order diffracted light rays in said reflected light flux, each of said reduced portions being defined by parallelly shifting said overlap area in opposite directions perpendicularly to the direction of said track by a distance equal to a maximum misalignment of an optical axis of said reflected light flux.

4,525,827

APPARATUS FOR REMOVING A CUT CHIP BY SUCTION

Horst Redlich, Berlin, Fed. Rep. of Germany, assignor to TELDEC Telefunken - Decca Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,047
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142206
Int. Cl.³ G11B 3/58
U.S. Cl. 369—72 10 Claims



1. Apparatus for removing a cut chip produced during cutting of information into a metal record carrier by a cutting stylus comprising, in combination: first means for producing suction air in the immediate vicinity of the cutting stylus and for removing the cut chip by means of the suction air; and second means for controlling the pressure of the suction air in dependence on the depth recording component of the recording.

4,525,828

OPTICAL MAGNETIC RECORDING DEVICE

Yasushi Higashiyama; Shu Chiba, and Norikazu Sawazaki, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 19, 1982, Ser. No. 359,808
Claims priority, application Japan, Mar. 24, 1981, 56-42911
Int. Cl.³ G11B 7/12, 11/14
U.S. Cl. 369—111 10 Claims

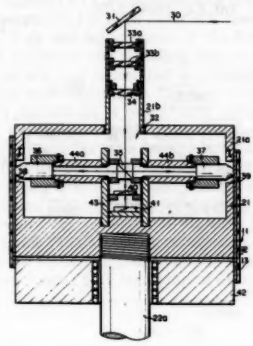
1. An optical recording device for forming recording tracks of an indented pattern on a magnetic recording tape, comprising:

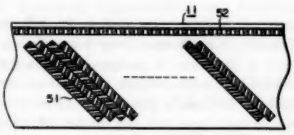
a rotary drum which has a circumferential wall having at least two windows and which is free to rotate about a rotating axis thereof, the magnetic recording tape being driven obliquely on said windows along an outer surface of the circumferential wall,

means for supplying a laser beam modulated by a signal to be recorded, and

an optical system, disposed inside the rotary drum, for con-

verting the laser beam incident on said optical system into at least two slit beams, major axes of sections of which form a predetermined angle and for emitting the slit beams on the magnetic recording tape through said windows, whereby said recording tracks of the indented pattern in





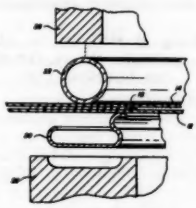
correspondence with the signal are formed obliquely on the magnetic recording tape with respect to a longitudinal direction of the magnetic recording tape by the slit beams so as to form different azimuths between adjacent recording tracks.

4,525,829

OPTICAL DISK ASSEMBLY RETAINING RINGS

Peter Affolter, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,430
Int. Cl.³ G01D *15/32*
U.S. Cl. 369—284 **5 Claims**



1. An optical disk assembly comprising:

A. a flexible, disk-shaped web assembly carrying a record layer, said web assembly having an information storage region and an annular peripheral region radially outward of said storage region; and

B. an annular retaining ring engaging said peripheral region of said web assembly, said retaining ring including

(1) a first ring member on one side of said web assembly, said first ring member having an annular recess with

(a) a generally U-shaped cross-sectional shape open at the side facing said web assembly and

(b) an undercut area, and

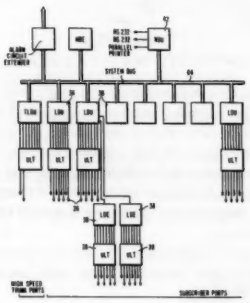
(2) a second ring member of malleable material on the other side of said web assembly, said second ring member having been deformed into said recess and said undercut area to provide a locking interfit with said first ring member with said annular peripheral region of said web assembly interleaved between the ring members in clamped circumferentially-symmetric tension.

4,525,830

ADVANCED NETWORK PROCESSOR

Albert E. Cohen, Merrick; William G. Hance, Selden; Ian Moir, Stony Brook, all of N.Y.; Thao Lane, and Frederic Caussarieu, both of Rennes, France, assignors to Databit, Inc., N.Y. and Ouest Standard Telematique, France

Filed Oct. 25, 1983, Ser. No. 545,030
Int. Cl.³ H04Q *11/04, 11/00*
U.S. Cl. 370—60 **23 Claims**



1. An advanced network processor (ANP) which uses distributed processing and is connectable to a plurality of subscriber input lines for data transmission and communication in accordance with a plurality of subscriber data protocols, said processor comprising, in combination:

(a) a plurality of line director units (LDU), each one of said LDU's including:

(i) a plurality of subscriber circuits to accommodate line terminated input lines;

(ii) a memory; and

(iii) computing means, connected to said subscriber circuits and to said memory, for receiving data from said subscriber circuits, for arranging said data into data packets and for storing said data in said memory, said computing means being programmable to selectively accommodate a plurality of subscriber data protocols;

(b) a plurality of universal line terminator (ULT) units, each one of said ULT's comprising means for interfacing said subscriber input lines and for providing said line terminated input lines to said subscriber circuits; each one of said ULT's being removably connectable to one of said plurality of LDU's so that each of said LDU's may be connected to a respective one of said ULT's which is configured to handle a selection of said subscriber input lines;

(c) a system bus interconnecting said plurality of LDU's; and

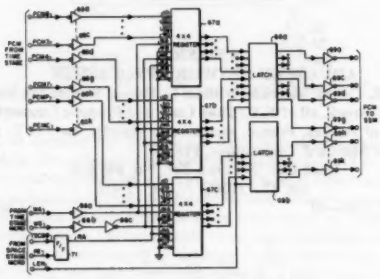
(d) a nodal director unit (NDU) for coordinating data flow between said plurality of LDU's and for performing supervisory functions; said data flow being routed along said system bus.

4,525,831

INTERFACE ARRANGEMENT FOR BUFFERING COMMUNICATION INFORMATION BETWEEN A TRANSMITTING AND RECEIVING STAGE OF A TIME-SPACE-TIME DIGITAL SWITCHING SYSTEM

Nathaniel Simmons, Downers Grove, Ill., and Kamal I. Parikh, Phoenix, Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,564
Int. Cl.³ H04Q 11/04
U.S. Cl. 370—63 **12 Claims**



1. An interface arrangement for buffering communication information between a transmitting stage and a receiving stage of a time-space-time digital switching network, said digital switching network including a network clock unit transmitting a master-clock signal and defining at least first and second time slots, said communication information transmitted from said transmitting stage during each time slot, said interface arrangement comprising:

storage means connected to said transmitting stage, said storage means including first and second addressable storage files;

first control signal generating means associated with said transmitting stage and arranged to receive said master-clock signal, said first control signal generating means developing and transmitting to said storage means during said first time slot a first set of control signals for addressing and writing said communication information into said first storage file, and during a second time slot a second set of control signals for addressing and writing said communication information into said second storage file;

second control signal generating means associated with said receiving stage and arranged to receive said master-clock signal, said second control signal generating means developing and transmitting to said storage means during said first time slot a first set of control signals for addressing and reading said communication information from said second storage file, and during said second time slot a second set of control signals for addressing and reading said communication information from said first storage file;

latching means connected to said storage means arranged to capture and transmit to said receiving stage said communications information read from said storage means, responsive to a latch enable control signal generated by said second control signal generating means; and

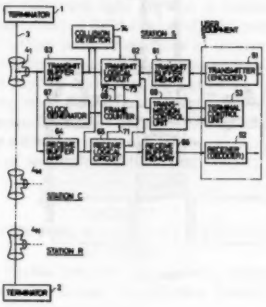
said storage means operated in said first time slot to write said communication information in said first storage file and simultaneously to read said communication information from said second storage file and said storage means operated in said second time slot to write said communication information in said second storage file and simultaneously to read said communication information from said first storage file.

4,525,832

DIGITAL SIGNAL TRANSMISSION SYSTEM

Fumio Miyao, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,215
Claims priority, application Japan, Jul. 7, 1982, 57/116811; Jul. 14, 1982, 57/121229
Int. Cl.³ H04J 3/02
U.S. Cl. 370—85 **12 Claims**



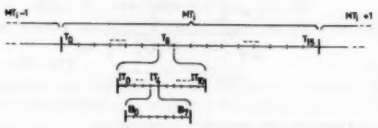
1. A digital signal transmission system for effecting time-division multiplexing/circuit switching transmission and reception of signals in the form of packets among a multiplicity of personal stations by causing digital signals transferred on a transmission cable to be fixedly positioned within periodically repeating frames along a time axis and further dividing each of the frames on said time axis into unit blocks thereby providing said personal stations with chances for digital signal transmissions, the multiplicity of personal stations including a master station which establishes system timing, the digital signal transmission system being characterized by the master station issuing a packet which incorporates therein a distance code and the other personal stations issuing packets which do not incorporate therein said distance code, said distance code being exclusively related to a time for signal propagation from a predetermined datum point located along the transmission cable to the master station on the transmission cable.

4,525,833

PROCESS FOR TIME-SEQUENCED MULTIPLEXING OF DATA ON A TRANSMISSION MEDIUM AND DEVICES TO IMPLEMENT THIS PROCESS

Egidio Cau, and Jean P. Lamiral, both of Paris, France, assignors to Lignes Telegraphiques et Telephoniques, Ste. Honorine, France

Filed Sep. 24, 1982, Ser. No. 422,385
Claims priority, application France, Oct. 9, 1981, 81 19081
Int. Cl.³ H04J 3/00
U.S. Cl. 370—99 **4 Claims**



1. A process for time-sequenced multiplexing of data on a transmission medium, in which data for transmission is coded in the form of binary words, combined in frames and multiframes, a frame (T) containing a series of binary words representing the data for transmission, and auxiliary bits representing at least synchronization and signalling data, and a multiframe (MT) containing a series of successive frames, the pro-

cess allowing N data channels to be multiplexed on a single carrier, each frame (T) containing N+1 binary words (IT) of the same length, only the first such word (IT_o) containing binary bits, and following words representing a coded sample of data to be transmitted on each channel respectively, the first word (IT_o) in odd index even ranking frames (T_1, T_2, T_3, T_5, T_7, T_9, T_{11}, T_{13}, T_{15}), in each multiframe containing synchronization signals (VT), signallying data (S) being contained in the first word (IT_o) of even index odd ranking frames (T_2, T_4, T_8, T_{12}, T_{14}), and being paired in the form S_i and $S_{i+(N/2)}$, where S represents the signalling data and i the rank of the channel to which it refers, and in which N equals 10, and in which, for each multiframe, the first word (IT_o) in the first frame (T_o) contains a multiframe synchronization signal (VMT), the first word (IT_o) in every even-ranking frame (T_1-T_{15}) contains the same frame synchronization signal (VT), and the first word (IT_o) in some of the remaining odd-ranking frame contains channel-signalling data as follows:

third frame (T_2), signalling of channels **1** and **6**;
fifth frame (T_4), signalling of channels **2** and **7**;
ninth frame (T_8), signalling of channels **3** and **8**;
thirteenth frame (T_{12}), signalling of channels **4** and **9**;
fifteenth frame (T_{14}), signalling of channels **5** and **10**.

4,525,834

SERVICE INTEGRATED DIGITAL TRANSMISSION SYSTEM

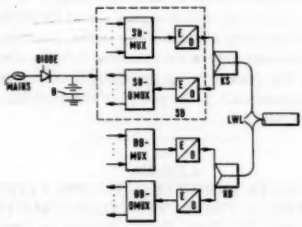
Klaus D. Schenkel, Oppenweiler, and Manfred Welzenbach, Backnang, both of Fed. Rep. of Germany, assignors to LICENTIA Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 3, 1981, Ser. No. 327,083

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045876

Int. Cl.[3] **H04B** *9/00*

U.S. Cl. 370—3 **9 Claims**



1. In a service integrated digital multiplex signal transmission system for transmitting narrowband and broadband signals between a central exchange terminal and a subscriber terminal, which system includes means defining a light conductor path connected between the terminals, a transmitter device at one terminal composed of narrowband signal transmitting means including a source of narrowband light signals, broadband signal transmitting means including a source of broadband light signals, and optical means connected between the light conductor path and the sources of light signals for supplying such light signals to the light conductor path, and a receiver device at the other terminal composed of broadband light signal receiving means, narrowband light signal receiving means, and optical means connected to the light conducting path for receiving light signals from that path and separately conducting the received narrowband and broadband light signals to respective ones of the receiving means, the device at the subscriber terminal being normally supplied with operating power by local utility mains, and including a charge accumulator for supplying operating power independently of the local mains, connected to the narrowband means at the subscriber terminal for supplying such power only to the narrowband means at the subscriber terminal in the event of interruption of the power supply provided by the local mains, and the system thus being arranged to effect transmission of the light signals over the light conductor path in the event of such local mains power interruption, at a reduced bit rate compared to the bit rate utilized when power is being supplied by the local mains, the improvement wherein said optical means in said transmitter and receiver devices are constructed and connected to said light conductor path such that said optical means and said light conductor path constitute means establishing separate optical transmission channels for the narrowband signals and for the broadband signals between said sources at said one terminal and said receiving means at said other terminal, said optical means at said subscriber terminal comprise a broadband signal directional coupler connected to said broadband means at said subscriber terminal for permitting broadband light signal transmission to be effected by directional multiplexing and a narrowband signal directional coupler connected to said narrowband means at said subscriber terminal for permitting narrowband light signal transmission to be effected by directional multiplexing, said source of broadband light signals comprises a laser diode coupling the broadband light signals to said path, and said source of narrowband light signals comprises a light emitting diode coupling the narrowband light signals to said path.

4,525,835

DUPLEX RADIO SYSTEM UTILIZING TIME COMPRESSION EXPANSION

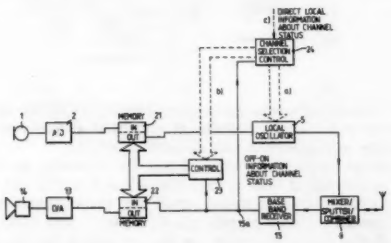
Ian A. W. Vance, Newport, England, and Stephen D. Bainton, Ottawa, both of Canada, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 6, 1982, Ser. No. 433,079

Claims priority, application United Kingdom, Oct. 13, 1981, 8130812

Int. Cl.[3] **H04L** *5/14;* **H04B** *1/56;* **H04J** *3/00*

U.S. Cl. 370—29 **9 Claims**



1. A duplex radio system having a plurality of terminals each operative for transmitting outgoing signals and receiving incoming signals on any of a plurality of transmission channels which can thus have a used or unused status, each of said plurality of terminals comprising:

a direct conversion receiver having a receiver input that has the incoming signals coupled thereto during operation in a receive mode, and a receiver output;

local oscillator means having a control input and an oscillator output and operative for generating and presenting at said oscillator output an output signal at a carrier frequency modulated with any modulating signal supplied to said control input, said oscillator output being coupled to said receiver input to supply thereto at least during operation in said receive mode the output signal of said oscillator means at said carrier frequency;

compression means for time compressing data, including an output connected to said control input of said oscillator means to supply the time compressed data to said control input as said modulating signal;

expansion means for time expanding data received, including an input coupled to said receiver output; and

control means having outputs coupled to said compression means and said expansion means to control modulating of said oscillator means with said modulating signal and hence transmission of said time compressed data to be transmitted during a transmit mode of operation, and expansion of said received data during the receive mode of operation.

4,525,836

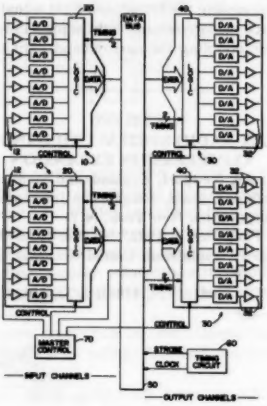
CIRCUIT FOR CONVERTING A LOGICAL SIGNAL INTO TWO BALANCED LOGICAL SIGNALS

Birney D. Dayton, Nevada City, and Dale L. Leavitt, Auburn, both of Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Dec. 27, 1982, Ser. No. 453,002

Int. Cl.[3] **H04J** *11/04, 3/02;* **H04B** *3/00*

U.S. Cl. 370—67 **13 Claims**



1. A device for selectively routing analog electrical signals from at least one of a plurality of sources to at least one of a plurality of destinations, said device comprising:

analog-to-digital converter means for receiving an input analog signal from at least one selected source and converting the input analog signal into a corresponding sequence of digital signals at a frequency f, said analog-to-digital converter means having one output line for each digit of the digital signals produced thereby and each output line having a single conductor;

a data bus having one line for each digit of the digital signals produced by the analog-to-digital converter means, each line of the data bus having two conductors;

selectively-operable level converting and driving means for converting the digital signal on each output line of the analog-to-digital converter means into a pair of balanced digital signals and applying the resulting sequence of digital signals to the data bus,

selectively-operable sampling means for accepting the sequence of digital signals from the the data bus;

digital-to-analog converter means for converting the sequence of digital signals into a replication of said input analog signal and applying said replication to at least one selected destination; and

timing means for defining a succession of digital data transmission periods, of duration substantially equal to 1/f, and also defining n discrete intervals within each transmission period, where n is a positive integer greater than one, said timing means being operative to control the level converting and driving means so that the digital signals representative of said input analog signal are applied to the data bus during the i^{th} interval of each of the successive transmission period (where i is a positive integer between one and n inclusive), and to control the sampling means so that it accepts digital signals from the data bus during the i^{th} interval of each of the successive transmission periods.

4,525,837

DIGITAL SIGNAL TRANSMISSION SYSTEM

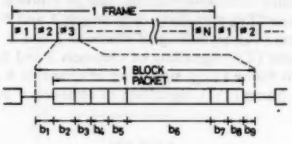
Yoichi Tan, and Fumio Miyao, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,720

Claims priority, application Japan, Jul. 7, 1982, 57-116812; Jul. 7, 1982, 57-116813

Int. Cl.[3] **H04J** *3/02*

U.S. Cl. 370—85 **9 Claims**



1. A digital signal transmission system for effecting time-division multiplexing/circuit switching transmission of signals in the form of packets among a multiplicity of stations by causing digital signals transferred on a telecommunication cable to be fixedly positioned within periodically repeating frames along a time axis and further dividing each of the frames on said time axis into unit blocks thereby providing said stations with chances for digital signal transmission, each block being capable of containing a packet, and each packet containing an overhead field for containing connection control data and a data field, and operation of the system including phases involving establishment of a call, transmission of data, and termination of the call; which digital signal transmission system is characterized by a transmitting station inserting connection control data not only in the overhead field but also into the data field of the packet being transmitted during periods of connection control such as the phases of the establishment/termination of a call.

4,525,838

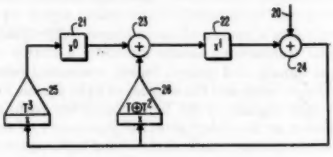
MULTIBYTE ERROR CORRECTING SYSTEM INVOLVING A TWO-LEVEL CODE STRUCTURE

Arvind M. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,846

Int. Cl.[3] **G06F** *11/10*

U.S. Cl. 371—37 **16 Claims**



1. A multibyte error correcting system operable to correct up to t_1 errors in each subblock of a block of data and t_2 errors in said block, where t_2 and t_1 are positive integers and $t_2 > t_1$, said block having:

(a) at least one subblock, each of which has at least one codeword containing up to $2^b - 1$ b-bit character positions, where b is any positive integer, each character

position consisting of a unique combination of binary bits representing data and $2t_1$ check bytes; and

(b) $2t_2$ b-bit block check bytes, said system comprising:

first syndrome generating means for generating two $2t_1$ syndrome bytes each containing b bits by combining $2t_1$ stored check bytes associates with each stored codeword with newly developed $2t_1$ check bytes during the reading of each said stored codeword, said check bytes corresponding to the modulo 2 sum of bit positions of said codeword selected systematically in accordance with a predetermined parity check matrix;

first syndrome processing circuitry operable to correct up to t_1 errors in each said codeword by processing said $2t_1$ syndrome bytes;

second syndrome generating means for generating $2t_2$ block syndrome bytes each containing b bits by combining said $2t_2$ stored block check bytes with $2t_2$ block check bytes developed after all said codewords of said block have been read and corrected, each of said t_2 block check bytes corresponding to the modulo 2 sum of bit positions of corrected said codewords that are selected systematically in accordance with said parity check matrix;

logic means for developing a new set of block syndrome bytes by modifying said original set of block syndrome bytes to reflect a miscorrection in one of said subblocks; and

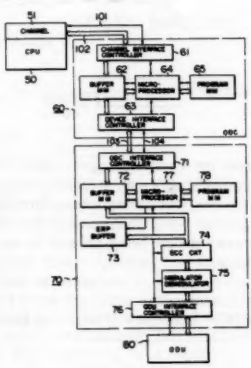
second syndrome processing circuitry for correcting up to t_2 errors in said one subblock by processing said modified set of $2t_2$ block syndrome bytes.

4,525,839

METHOD OF CONTROLLING STORAGE DEVICE

Masafumi Nozawa, Minami-ashigara, and Michio Miyazaki, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,718
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—38 **34 Claims**



19. A method of controlling a storage device using a recording medium with a plurality of recording blocks each having a unique address, said recording medium being divided into a normal recording area which is first accessed in operations of reading and writing data, and an alternative area having alternative blocks for storing data in place of defective blocks in said normal recording area, said method comprising the steps of:

storing a first pointer information indicating the address of an available alternative block in said alternative area;

combining said first pointer information with each of a plurality of data blocks to be written concurrently on said recording medium thereby to produce information sets of a first group;

writing sequentially said information sets of the first group into unused continguous recording blocks within said normal recording area on said recording medium;

reading said information sets of the first group which have been written on said recording medium;

checking said information sets of the first group read from said recording medium to detect defective recording blocks;

combining, if a defective block has been detected, each data block corresponding to the defective block with a second pointer information indicating the individual address of said defective recording block thereby to produce information sets of the second group depending on the number of detected defective blocks; and

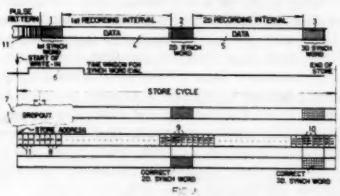
writing sequentially said information sets of the second group into unused recording blocks within said alternative area starting from an alternative block corresponding to said first pointer information.

4,525,840

METHOD AND APPARATUS FOR MAINTAINING WORD SYNCHRONIZATION AFTER A SYNCHRONIZING WORD DROPOUT IN REPRODUCTION OF RECORDED DIGITALLY ENCODED SIGNALS

Richard Heinz, Muehltal, and Reinhard Kutzner, Darmstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,345
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151251
Int. Cl.³ G06F *11/00*; H04L *7/08*
U.S. Cl. 371—47 **10 Claims**



1. Method utilizing random-access temporary storage means, a synchronization word reference source and storage address counting and comparison means, all under control of a program control unit, and also a jump back circuit interconnecting said counting and comparison means with said program control unit, of reproducing digitally encoded data signals registered on a storage medium in data segments bracketed between synchronizing words, each having a beginning address, under conditions in which signal dropout intervals occur, wherein word synchronization is maintained for the data segment following a synchronizing word which is garbled or suppressed by a signal dropout or error, by performing the steps of:

storing in said temporary storage means (**18**, **19**), the entire data of data segments bracketed between reproduced synchronizing words, along with the reproduced synchronizing words which thus bracket said information, with at least two segments of said data being stored at the same time;

generating timing window signals for expected synchronizing words;

determining that a synchronizing word has been missed when no synchronizing word has been recognized during the presence of a said timing window signal,

re-establishing the original ordered relation of said data

information following a missed synchronizing word by calculating back to the beginning address of a missed synchronizing word and by providing correction of data bit position by reference to at least one of the synchronizing words following the end of the data segment that follows said missed synchronizing word.

4,525,841

DOUBLE CHANNEL PLANAR BURIED HETEROSTRUCTURE LASER

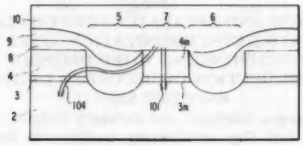
Mitsuhiro Kitamura; Ikuo Mito, and Kohroh Kobayashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,990

Claims priority, application Japan, Oct. 19, 1981, 56-166666; Dec. 23, 1981, 56-208789; Jan. 29, 1982, 57-13451; Feb. 19, 1982, 57-25715

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—48 **17 Claims**



1. A semiconductor laser having a buried double heterostructure, comprising:

a semiconductor substrate of a first conductivity type;

a multi-layer double heterostructure including successively at least a first cladding semiconductor layer of the first conductivity type, an active semiconductor layer, and a second cladding semiconductor layer of a second conductivity type, said active semiconductor layer having a narrower bandgap than those of said first and second cladding semiconductor layers, said multi-layer double heterostructure having a stripe portion with channels formed along both sides of said stripe and extending through said second cladding semiconductor layer and active semiconductor layer to reach said first cladding layer, and having remaining portions, outside said channels, including said first, active, and second semiconductor layers;

a current blocking layer formed on said channels and said remaining portions of said multilayer double heterostructure except for the top surface of said stripe portion, for blocking a current flow therethrough;

resonant means for feeding light back in the opposite directions of the length of said stripe and parallel to said active semiconductor layer; and

a pair of electrodes for supplying a voltage to forward bias said semiconductor laser.

4,525,842

LASER DEVICE AND METHOD

John D. Myers, 900 Sandalwood East, Perrysburg, Ohio 43551

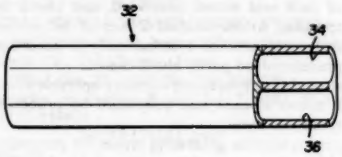
Filed Feb. 24, 1984, Ser. No. 583,504

Int. Cl.³ H01S *3/08*

U.S. Cl. 372—92 **26 Claims**

1. A laser device, comprising:

a body member formed of an electrical insulating material having a low coefficient of thermal expansion and forming an exoskeleton for said laser device, said body member having an internal chamber opening through its opposed ends, a front laser mirror permanently attached to one of said body member ends sealing said one end, a laser filter within said body member chamber having elongated parallel bores extending generally perpendicularly to the reflective surface of said front laser mirror, a laser reflector surrounding said laser filter within said body chamber permanently aligning said filter within said chamber, a laser flashlamp located within one of said laser filter bores and permanently aligned therein and an elongated laser rod located within the other of said laser filter bores permanently aligned therein, and a back laser mirror aligned



with said laser rod having a reflective surface generally perpendicular to the longitudinal axis of said laser rod, said back laser mirror permanently attached to the opposed end of said body member, opposite said front laser mirror, sealed in said opposed body member end, said body member thus providing a sealed construction with the laser elements in fixed permanent alignment.

4,525,843

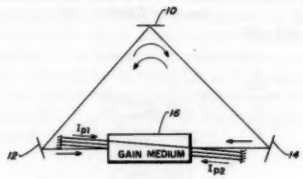
RING LASER WITH WAVEFRONT CONJUGATING BEAMS

Jean-Claude Diels, Denton, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1982, Ser. No. 373,188

Int. Cl.³ H01S *3/083*

U.S. Cl. 372—94 **5 Claims**



1. An improvement for a ring laser gyro which reduces the lock-in frequency comprising: a gain medium coupled between two optical cavity means, one cavity means forming a closed optical ring with counter wave propagations inv said ring, an the other optical cavity means being off axis to said leg containing said gain medium and forming a short linear resonant cavity, whereby wave mixing of radiation in said ring and radiations in said resonant cavity produces wave front conjugation to reduce lock in frequency of said ring laser gyro.

4,525,844

METHOD FOR INTERCHANGING N PARTIAL BANDS

Helmut Scheuermann, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,695

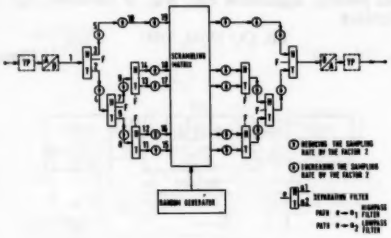
Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120357

Int. Cl.³ H04K *1/04*

U.S. Cl. 375—2.1 **6 Claims**

1. A method for interchanging the frequency positions of n partial bands, each having a bandwidth b, of a signal frequency band, comprising: sampling signals in the frequency band at an input sampling rate equal to $fA=4\ (fu+2\mu_o b)$ where fu is the lower limit frequency of the signal frequency band, and μ_o is

the highest power of two contained in, but not including, n; separating the sampled signals associated with each partial band into separate channels in stages in each of which sample signals are separated into high frequency and low frequency groups and the sampling rate is reduced; altering the positions of the channels in a scrambling matrix controlled by a random sequence generator; and spectrally recombining the signals in



the separate channels into a signal extending across the signal frequency band, wherein said step of separating is performed in $1+\log_2 2\mu_o$ stages by means of $n-1$ filters connected in a tree structure to each effect one separation to provide n partial band outputs, with the sampling rate being reduced each time by the factor $2\mu_o$·b divided by a multiple of 2, and each filter separates signals at opposite sides of a transition frequency which is one-fourth of the associated sampling rate.

4,525,845

BALANCED CIRCUIT FOR CONNECTING RECEIVER AND TRANSMITTER TO TRANSMISSION LINE

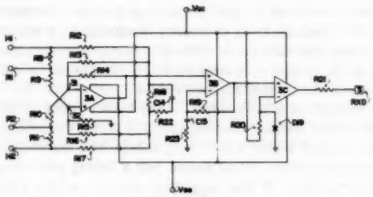
David E. Dodds, and Ludo A. Bertsch, both of Saskatoon, Canada, assignors to Develcon Electronics Ltd., Saskatoon, Canada

Filed Feb. 16, 1983, Ser. No. 467,017

Claims priority, application United Kingdom, Feb. 26, 1982, 8205660

Int. Cl.³ H04Q *1/30*

U.S. Cl. 375—36 **10 Claims**



1. Apparatus for receiving and transmitting electrical signal voltages along a transmission line comprising two first terminals each for connecting to a respective one of a two-wire transmission line, a differential amplifier having a pair of inputs for amplifying differential voltages applied to the inputs thereof to produce an output signal voltage for transmission to signal receiving equipment, balance impedance means having an impedance approximate to the impedance provided by the transmission line, two transmit terminals, means for connecting a signal voltage at said transmit terminals across said transmission lines for transmission therealong and across said balance impedance means, summing connection means for connecting across said differential amplifier inputs the voltage across said transmission lines and the voltage across said balance impedance means inverted relative thereto whereby said transmitted signal voltage produces no output signal voltage from said differential amplifier, and resistance means connected between each of the first terminals and an effective ground and between each of the differential amplifier inputs and the effective ground and arranged whereby a common voltage at the first terminals presents equal voltages at the differential amplifier inputs whereby the common voltage produces no output signal voltage from said differential amplifier.

4,525,846

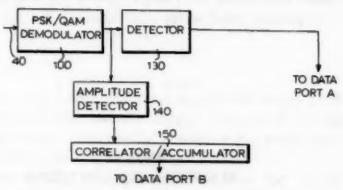
MODEM IN-BAND SECONDARY CHANNEL VIA RADIAL MODULATION

Gordon Bremer, Clearwater; William L. Betts, Madeira Beach, and Robert T. Greene, St. Petersburg, all of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 27, 1982, Ser. No. 453,165

Int. Cl.³ H04L *27/08*

U.S. Cl. 375—39 **2 Claims**



1. A method of transmitting a first and second input series of input bits simultaneously, over a single data channel comprising:

generating a series of symbols having a radial amplitude and corresponding to said first series of input bits;

maintaining the radial amplitude of said symbols at a first level if said second input bits have a first value and alternating said radial amplitude between said first value and a second value for consecutive symbols when said second input bits have a second value;

sending said symbols over said communication channel, to a receiver;

detecting the radial amplitudes of the signals received by said receiver;

correlating the radial amplitudes of a last preselected number of received signals to obtain a correlated value;

comparing said correlated value to a threshold value; and

generating a series of output bits having a first value if said correlated value is above said threshold value; and a second value if said correlated value is below said threshold value.

4,525,847

QAM ENCODER

Gordon Bremer, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Nov. 10, 1982, Ser. No. 440,500

Int. Cl.³ H04L *27/20*

U.S. Cl. 375—59 **10 Claims**

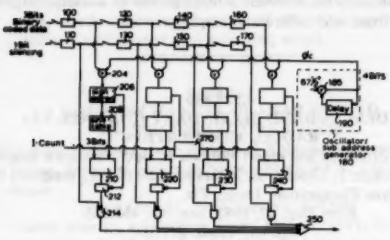
1. An encoder for a QAM transmitter for transmitting a series of symbols, each symbol corresponding to a group of bits, comprising:

a plurality of delay means through which said group of bits is delayed sequentially by a first period;

an oscillator for generating a subaddress signal which is incremented periodically in accordance with a second period which is shorter than said first period;

a plurality of look-up means corresponding to said delay means and having memory means, each of said look-up means receiving a delayed group of bits from a respective delay means and being provided for selecting a value from

said memory means which corresponds to said delayed group of bits and said subaddress signal; and



means for adding the value from each of said look-up means to produce said series of symbols.

4,525,848

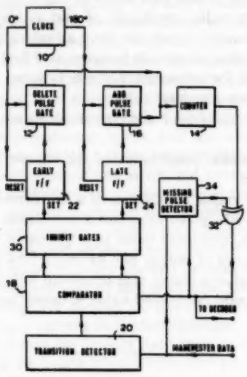
MANCHESTER DECODER

Raymond W. Simpson, Hamilton Square, N.J., assignor to Prutec Limited, London, England

Filed Jun. 2, 1983, Ser. No. 500,461

Int. Cl.³ H03D *3/22*

U.S. Cl. 375—87 **4 Claims**



1. A circuit for generating a timing signal in a decoder of a signal receiver for receiving radio signals carrying Manchester encoded data, the circuit comprising an oscillator, a frequency divider for dividing the frequency of signals derived from the oscillator to generate a divider output signal having transitions therein, a comparator for comparing the times of the transitions in the divider output signal with transitions in Manchester data carried by a signal which, in operation, is received by the receiver, and means for selectively adding a pulse to and subtracting a pulse from the pulses applied to the frequency divider by the oscillator in dependence upon the relative timing determined by the comparator in such manner as to lock the phase of the divider output signal on to the phase of the Manchester data, characterized in that a squelch circuit is provided which detects the strength of the signal received by the receiver and produces an output signal in response to a drop in the detected signal strength, the squelch circuit output signal being effective to inhibit phase control by the comparator.

4,525,849

DATA TRANSMISSION FACILITY BETWEEN TWO ASYNCHRONOUSLY CONTROLLED DATA PROCESSING SYSTEMS WITH A BUFFER MEMORY

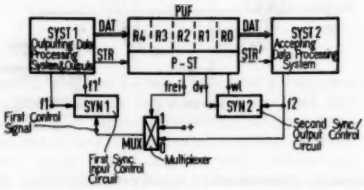
Gerhard Wolf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 477,980

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213345

Int. Cl.³ H04L *7/00*

U.S. Cl. 375—118 **21 Claims**



1. A data transmission facility connected by data and control lines between asynchronously controlled data accepting and data outputting processing systems for the transfer of data words from a data output of the outputting system to the transmission facility and from the facility to a data input of the accepting system, each system having an associated system clock producing clock pulses of a given timing pattern, comprising:

a buffer memory means having at least three memory section means for intermediate storage of a respective data word from the outputting system;

first and second synchronization circuit means, the first circuit means comprising an input control for the buffer memory means which is synchronous with the data outputting system clock and is connected to the data output of the outputting system for controlling transfer of a data word into the memory section means of the buffer memory means available for the transfer, and the second circuit means comprising an output control synchronous with the system clock of the data accepting system and connected to the buffer memory means for controlling forwarding of a respective data word from a memory section means of the buffer memory means available for output to the data input of the data accepting system;

after storage of a data word in the buffer memory means, said buffer memory means creating a corresponding second control signal which is synchronized via the second synchronization circuit means into a timing pattern of the system clock of the accepting system while avoiding logically undefined intermediate statuses in the respective data and control line, said second synchronization circuit means creating a second synchronization control signal which initiates the forwarding of a stored data word to the data accepting system;

means for generating a first control signal dependent on the given timing pattern of the system clock of the accepting system;

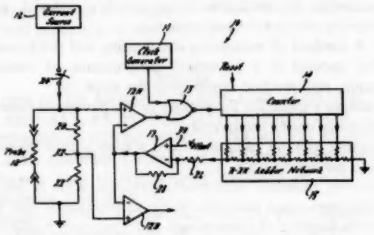
the first synchronization circuit means receiving the first control signal; and

the first synchronization circuit means synchronizing said first control signal into the timing pattern of the outputting system clock while avoiding logically undefined intermediate statuses in the respective data and control lines and creating a first synchronization control signal for initiating output and transfer of a data word together with a strobe signal from the data output of the data outputting system, said strobe signal initiating intermediate storage of said data word.

4,525,850
FLUID LEVEL SENSOR EMPLOYING HOT WIRE PROBE AND DIGITAL SAMPLE AND HOLD CIRCUITRY

Kenneth L. Miller, Brownsboro, Ala., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 15, 1982, Ser. No. 418,343
Int. Cl.³ G01F *23/00, 23/24*
U.S. Cl. 377—19 **3 Claims**



1. In a fluid level sensing system which employs an electrical resistance, current excited probe, an electronic control circuit to measure the output of said probe, to memorize its initial value and to provide a warning signal when a preselected threshold is exceeded comprising:

a clock generator fed into a two input NOR gate; a resettable binary counter which counts clock pulses generated by said clock generator when presented with said pulses by said NOR gate; an R-2R resistor ladder network which receives the ouput from said binary counter and in response to the increased count from said counter incrementally and proportionally increases its voltage output; an inverting operational amplifier which when presented at its inverting input with said increasing voltage output from said R-2R resistor ladder network will generate an output which is a function of an input resistor and feedback resistor connected to said inverting input and an offset voltage which is presented to the non-inverting input to said inverting operational amplifier; an operational amplifier to compare said output of said inverting operational amplifier with the voltage across said electrical resistance probe and present an output based on said comparison to said two input NOR gate to control the transfer of said clock pulses to said resettable binary counter; a voltage divider means across said probe; an operational amplifier to compare said output of said inverting operational amplifier with a preselected threshold voltage which is generated at the division point of said voltage divider means and which generates a trigger pulse when said threshold voltage is exceeded.

4,525,851
FREQUENCY GENERATOR CIRCUIT

Philip S. Smith, and Michael G. Gallup, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

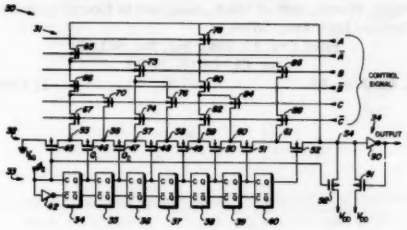
Filed Jun. 6, 1983, Ser. No. 501,314
Int. Cl.³ H03K *21/36*
U.S. Cl. 377—110 **9 Claims**

1. A frequency generator circuit for providing an output signal which is synchronous with a clock signal of predetermined frequency and which has a frequency which is proportional to the frequency of the clock signal, comprising:

frequency divider means having an input for receiving the clock signal, and a plurality of ranked outputs, each of said outputs providing a divided signal having a frequency proportional to the predetermined frequency;

a plurality of switching means connected in series between a reference node and an output node, and forming a plurality of rank ordered nodes, the first of said switching means having a control electrode connected to the input of the frequency divider means and each of the remaining switching means having a control electrode connected directly to a predetermined one of said ranked outputs of the frequency divider means;

decode means connected directly to each of the rank ordered nodes for selectively coupling the output node to a predetermined one of the rank ordered nodes in response to a binary input control signal, comprising:



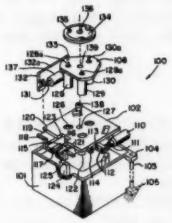
at least one node select transistor coupled between each rank ordered node and the output node, each of the node select transistors having a control electrode connected directly to the control signal; and

latching means having an input connected to the output node, and an output for latching the output node at a predetermined logic level during an inactive period and otherwise providing the synchronous output signal.

4,525,852
ALIGNMENT APPARATUS

Lawrence M. Rosenberg, San Jose, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Filed Mar. 15, 1983, Ser. No. 475,420
Int. Cl.³ G05G *11/00;* G21K *5/00;* A47B *11/00*
U.S. Cl. 378—34 **20 Claims**



1. Alignment apparatus comprising:

means for supporting an object to be aligned, including

a substantially planar support plate;

a substantially rotatable plate positioned in a plane parallel to said support plate and having a spaced series of piezoelectric linear motors oriented perpendicular therewith, said motors each having a movable shaft adapted to abut and support a rearside of said support plate for moving said support plate in the Z axis;

a theta drive piezoelectric linear motor for rotatably moving said rotatable plate;

a substantially planar x-y motion plate positioned in a plane parallel to said rotatable plate;

first flexure means for connecting said rotatable plate to said x-y motion plate;

a pair of piezoelectric motors connected to said x-y motion plate for driving said motion plate along x and y coordinates in the plane of said motion plate; and

second flexure means for supporting said motion plate, all of

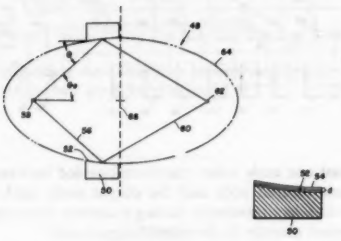
said piezoelectric motors being adapted to be driven variously in off-on, in-out sequences to move said support plate in x, y, z and θ directions as necessary to orient said object to a desired spatial position.

4,525,853

POINT SOURCE X-RAY FOCUSING DEVICE

John E. Keem, Bloomfield Hills, and Gerald F. Marshall, Grosse Pointe Woods, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 17, 1983, Ser. No. 542,886
Int. Cl.³ G01N *23/20*
U.S. Cl. 378—84 **13 Claims**



1. A point source non-imaging X-ray focusing device, comprising:

a focusing element formed from a section transverse to the axis of revolution of an ellipse, said element having a focusing surface;

a plurality of layer pairs formed on one another on said focusing surface, said layer pairs having X-ray dispersive properties substantially at a predetermined wavelength of interest;

said layer pairs and said surface designed to focus said X-ray wavelength from a point source to a focus point; and

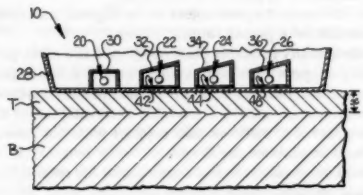
said ellipse having a center plane with respect to said point source and said focus point and said focusing element section being formed from a portion of said ellipse chosen to maximize the total reflected intensity of said X-ray wavelength.

4,525,854

RADIATION SCATTER APPARATUS AND METHOD

John L. Molbert, and Eddie R. Riddle, both of Durham, N.C., assignors to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Mar. 22, 1983, Ser. No. 477,820
Int. Cl.³ G01N *23/00*; G01T *1/16*; G01V *5/00*; H01J *39/00*
U.S. Cl. 378—089 **18 Claims**



1. A radiation scatter apparatus for use in association with a relatively thin overlay material overlying a substrate material to measure the density of the overlay material, the thickness of the overlay material, and the density of the substrate material, said apparatus comprising:

source means for emitting gamma radiation into the overlay material and the substrate material;

detector means including at least three radiation detectors located in predetermined spaced relation to said source for detecting scattered radiation, each detector being so positioned and having such filtering characteristics so as to measure radiation distinctive from the radiation measured by the other detectors; and

recording means operatively associated with said detector means for separately recording measured radiation information from each said detector for use with derived mathematical relations to determine the density of the overlay material, the thickness of the overlay material, and the density of the substrate material.

12. A method of measuring the density and thickness of an overlay applied in a pavement maintenance or resurfacing operation, said method comprising the steps of:

obtaining a value for the density of the pavement base that is directly under the overlay;

directing gamma radiation from a source into the overlay and pavement base;

detecting radiation scattered therefrom with at least two detectors, each detector being so positioned and having such filtering characteristics as to measure radiation distinctive from the radiation measured by any other detector;

simultaneously solving at least two derived mathematical equations, each equation relating one of the radiation measurements to the density of the pavement base and the two unknown values for the density and thickness of the overlay; and

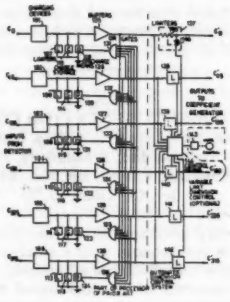
disclosing the calculated values.

4,525,855

VARIABLE RATE AND VARIABLE LIMIT DIMENSION CONTROLS FOR A DIRECTIONAL ENHANCEMENT SYSTEM

Martin E. G. Willcocks, Somersham, England, assignor to John C. Bogue, Los Angeles and Wesley Ruggles, Jr., Marina Del Ray, both of, Calif.

Continuation of Ser. No. 296,881, Aug. 27, 1981, abandoned, which is a continuation of Ser. No. 19,617, Mar. 12, 1979, abandoned, which is a continuation of Ser. No. 885,959, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 799,437, Mar. 23, 1977, abandoned, which is a continuation of Ser. No. 667,513, Mar. 16, 1976, abandoned. This application May 25, 1983, Ser. No. 497,216
Int. Cl.³ H04S *3/02*
U.S. Cl. 381—22 **2 Claims**



2. In a directional enhancement system for quadraphonic decoders having a matrix quadraphonic decoder, a detector, a processor having attack-decay circuits including charge storage devices, and a matrix multiplier, said processor being operative to provide a plurality of control signals and including a variable rate dimension control system, said variable rate dimension control system comprising:

a plurality of voltage variable resistors equal in number to the number of control signals provided in said directional enhancement system, each one of said plurality of voltage-variable resistors having a resistive current path and a control terminal; the resistive current paths each forming part of the discharging devices of the attack-decay control circuits of said processor, and said control terminals being connected in common to an externally variable voltage to vary the rate of decay of charge of each of said charge storage devices forming part of said attack-decay circuit of said processor of said directional enhancement system.

4,525,856

AMPLIFIER ARRANGEMENT FOR ACOUSTIC SIGNALS, PROVIDED WITH MEANS FOR SUPPRESSING (UNDERSIRED) SPURIOUS SIGNALS

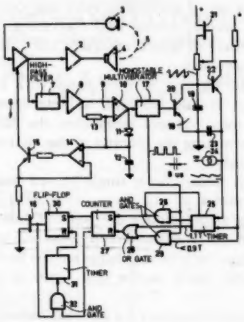
Daniël J. H. Admiraal, Lieshout, and Benjamin Lopes Cardozo, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 847,042, Oct. 31, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,144

Claims priority, application Netherlands, Nov. 8, 1976, 7612358

Int. Cl.³ H04M *1/20*; H04R *3/02*

U.S. Cl. 381—93 **8 Claims**



1. An amplifier circuit for acoustic signals comprising, gain controllable amplifier means for said acoustic signals, a control circuit coupled to said amplifier means to derive a first control signal for reducing the gain of the amplifier means in the presence in the amplifier means of an undesired acoustic feedback signal exhibiting a regular periodicity characteristic, a high-pass filter coupled to the amplifier means to receive and separate a part of the signal amplified, and a periodicity detector coupled to the output of the filter and operative to discriminate between an acoustic feedback signal having a regular periodicity and signals having an irregular periodicity characteristic thereby to produce a second control signal for operating the control circuit to derive said first control signal when the periodicity detector detects the presence of said acoustic feedback signal exhibiting said regular periodicity at the output of the filter.

4,525,857

CROSSOVER NETWORK

Robert A. Orban, Belmont, Calif., assignor to Orban Associates, Inc., San Francisco, Calif.

Division of Ser. No. 480,921, Mar. 31, 1983, Pat. No. 4,495,643. This application Sep. 4, 1984, Ser. No. 646,793

Int. Cl.³ H03G *5/00*

U.S. Cl. 381—100 **4 Claims**

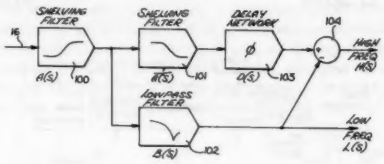
1. A crossover network for an audio signal comprising:

a first shelving filter for receiving said audio signal;

a second shelving filter coupled to the output of said first shelving filter;

a lowpass filter coupled to the output of said first shelving filter;

a delay network coupled to the output of said second shelving filter;



subtracting means for subtracting two signals coupled to the output of said delay network and said lowpass filter;

whereby a crossover network is realized with the high frequency band being present at the output of said subtraction means and the low frequency band at the output of said lowpass filter.

4,525,858

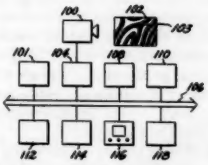
METHOD AND APPARATUS FOR RECONSTRUCTION OF THREE-DIMENSIONAL SURFACES FROM INTERFERENCE FRINGES

Harvey E. Cline; Andrew S. Holik, both of Schenectady, and William E. Lorensen, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,076

Int. Cl.³ G06K *9/48*; G09F *9/00*

U.S. Cl. 382—1 **23 Claims**



1. The fully automatic method of processing a pair of optically generated two-dimensional continuous, branched fringe patterns representative of a three-dimensional surface comprising the steps of:

A. transforming a pair of optically generated two-dimensional fringe patterns into first and second electronic images, said pair of fringe patterns representing the same three-dimensional surface, but containing sufficient information to permit the topography of said three-dimensional surface to be determined therefrom;

B. digitizing the first and second electronic images to form first and second arrays of integers;

C. thresholding the digitized images to transform the integers of the first and second arrays to either the digit one or the digit zero;

D. segmenting electronically the thresholded images to define first and second sets of fringes;

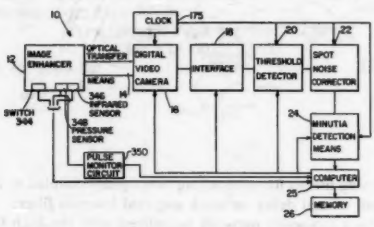
E. detecting electronically the edges of the fringes of the first and second sets of fringes to define first and second sets of contours; and

F. sequencing electronically the first set of contours by comparing the second set of contours to the first set of fringes to determine the spatial coordinates of the three-dimensional surface.

4,525,859
PATTERN RECOGNITION SYSTEM

Ronald E. Bowles, 2105 Sondra Ct., Silver Spring, Md. 20904, and David E. Bowles, 6009 Jamina Downs, Columbia, Md. 21045

Filed Sep. 3, 1982, Ser. No. 414,586
Int. Cl.³ G06K 9/00
U.S. Cl. 382—5 **32 Claims**



1. A system for electronically investigating a pattern that can be divided into an array of points, the system comprising:

signal producing means for producing an electrical signal for each point on a matrix of points, said matrix having "K" points by "L" points, wherein K and L are real integers with one representing the points in the matrix line and the other representing the points in a matrix column, said signal producing means providing a serial stream of signals;

selecting means for progressively selecting locatable known groups of said produced electrical signals, which groups correspond to subarrays of said points, each said subarray having M lines by N columns, including a peripheral set of $2(M-2)+2N$ points and a central set of $M\times N-2(M-2)-2N$ points, wherein said selecting means is comprised of a first storage means for storing and providing said electrical signals from said signal producing means on a first-in, first-out basis;

first determining means for checking and determining for each selected group of said signals whether a first, preselected number of signals corresponding to said central set of points have a first predetermined value and hence whether there is a central hit;

second determining means for checking and determining for each selected group of signals whether no more than a second, preselected number of the signals corresponding to said peripheral set of points have a second predetermined value, and hence whether there is a peripheral hit, wherein said second determining means comprises a memory means for storing $2^{2(M-2)+2N}$ coded outputs, said memory means having an enable input and $2(M-2)+2N$ address lines which are connected to said $2(M-2)+2N$ peripheral storage cells; and said first determining means comprises gate means, the inputs of which are connected to said central storage cells and the output of which is connected to said enable input, said gate means for providing an output signal to enable said memory means when said central storage cells contain said first preselected number of signals such that said memory means outputs the data stored at the memory address indicated by the signals stored in said peripheral storage cells;

third determining means responsive to said first and second determining means for determining the location of each subarray of points for which a central hit and a peripheral hit for the same group of corresponding signals were determined; and

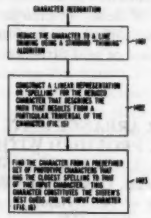
memory means for storing each determined location.

21. The system as claimed in claim 1 wherein said second determining means comprises a decoder means having an enable input connected to said first determining means and having data inputs, said decoder means for producing when enabled a signal representing the decoded data inputs.

4,525,860
CHARACTER RECOGNITION ARRANGEMENT

Richard H. Boivie, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 4, 1982, Ser. No. 337,092
Int. Cl.³ G06K 9/80
U.S. Cl. 382—21 **7 Claims**



1. The machine method of character recognition comprising the steps of

thinning, under control of said machine, a character to be recognized to produce a line drawing or skeleton and storing said thinned character in said machine,

traversing, under control of said machine, said thinned character using a set of traversing rules and controlling said machine to derive, during said traversing, a name, the individual letters of which represent the various physical directions traversed,

machine comparing said derived name to a dictionary of names stored in said machine to determine the stored name that most closely resembles the derived name thereby determining the identity of the character that has been traversed,

said dictionary containing a single stored name for each possible character,

said comparing step includes the steps of subdividing said dictionary of stored names into at least one subdictionary of letter strings each of said letter strings having as a first letter the same letter as the first letter of said derived name, and

examining said subdictionary for matches between particular letters of said derived name and particular letters of one of said subdictionary letter strings.

4,525,861
ZONED DATA COMMUNICATIONS SYSTEM FOR COMMUNICATING MESSAGE SIGNALS BETWEEN PORTABLE RADIOS AND A HOST COMPUTER

Thomas A. Freeburg, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 441,327, Nov. 12, 1982, Pat. No. 4,481,670.
This application Aug. 13, 1984, Ser. No. 639,770
Int. Cl.³ H04B 1/00, 7/00
U.S. Cl. 455—33 **2 Claims**

1. A data communications system for communicating message signals from a host computer throughout a geographical area divided into zones, comprising:

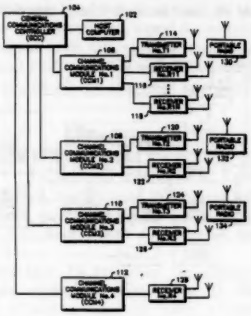
a communications controller coupled to the host computer for communicating message signals therebetween;

a radio channel for carrying message signals;

a plurality of remote radio stations located anywhere in the geographical area and including a transmitter and antenna for transmitting message signals on the radio channel and a receiver switchably couplable to either the transmitter antenna or another antenna for receiving message signals; and

a plurality of radio channel communications modules each located throughout the geographical area for covering at least one zone and coupled to the communications controller for communicating message signals on the radio

channel to the remote radio stations in the zones covered thereby, each radio channel communications module coupled to a transmitter and antenna for transmitting



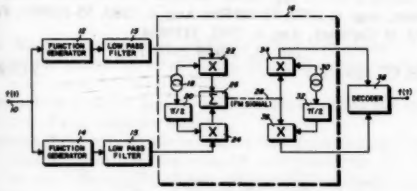
message signals on the radio channel and to a receiver and at least two antennas for receiving message signals from the radio channel.

4,525,862

TRANSFORM MODULATION SYSTEM

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1980, Ser. No. 165,474
Int. Cl.³ H04B *1/68*
U.S. Cl. 455—47 **24 Claims**



1. A transmission system comprising:
first input means for receiving an audio signal;
function generating means for providing a first trigonometric transform function of the audio signal;
carrier generating means for generating a carrier signal;
modulating means for modulating said carrier signal with said trigonometric transform function signal;
single sideband transmission means for transmitting at least the sidebands of the carrier modulated with said transform function signal:
second input means for receiving the modulated transmitted carrier signal;
demodulating means for detecting the transform function and for deriving a Hilbert transform thereof; and
decoder means for deriving the audio signal from the output signals of the demodulating means.

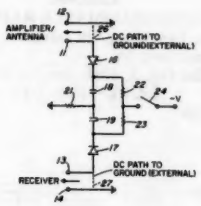
4,525,863

SOLID STATE TRANSMIT/RECEIVE SWITCH

Francis H. Stites, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 19, 1983, Ser. No. 543,570
Int. Cl.³ H04B *1/48*
U.S. Cl. 455—83 **6 Claims**

1. A transmit/receive switching circuit for a radio transceiver comprising
first means coupled to a transmitting amplifier and to an antenna;
second means coupled to a receiver;
a serial circuit coupled between said first means and said second means, said serial circuit including a first diode poled in one direction, capacitive means, and a second diode poled in a direction opposite to said one direction;
control means operative during a receiving phase of said transceiver, for providing a first condition to cause both of said serially connected, polarity opposed diodes to simultaneously conduct, so that radio signals received by said antenna can pass through said first means, said serial circuit, and said second means to said receiver, and



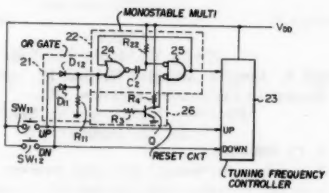
operative during a transmitting phase of said transceiver for providing a second condition to cause both of said serially connected, polarity opposed diodes to not simultaneously conduct, so that neither transmission signals from said transmitting amplifier nor radio signals from said antenna can pass through said first means, said serial circuit, and said second means to said receiver;
a resistive direct current path across said capacitive means, and
means responsive to the first condition of said control means for selectively applying a voltage potential to said path of such magnitude and polarity to cause both said first diode and said second diode to undergo conduction.

4,525,864

DEVICE FOR GENERATING A TUNING FREQUENCY SET COMMAND SIGNAL OF A TUNER SYSTEM

Yasuo Kawakami, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,043
Claims priority, application Japan, Oct. 29, 1982, 57-190364
Int. Cl.³ H03J *7/20*; H04B *1/16*
U.S. Cl. 455—160 **2 Claims**



1. A device for generating a tuning frequency command signal of a tuner system, including:
first control signal generation means for generating a first control signal for shifting a tuning frequency of the tuner system in a first direction;
second control signal generation means for generating a second control signal for shifting the tuning frequency in a second direction;
timing means for generating a timing signal during a prede-

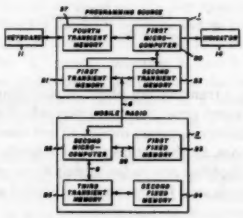
termined time period after initiation of the generation of either one of said first and second control signals; and

control means coupled to said timing means and said first and second control signal generation means for controlling the tuning frequency of the tuner system, in accordance with a manual control mode and an automatic control mode, said control means operates to select said automatic control mode when the first or second control signal is present after extinction of said timing signal, characterized by a reset means coupled to said first and second control signal generation means for resetting said timing means at a time when either one of the first and second control signals disappears.

4,525,865
PROGRAMMABLE RADIO

David F. Mears, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Oct. 3, 1983, Ser. No. 538,178
Int. Cl.³ H04B 1/16
U.S. Cl. 455—186 **9 Claims**



1. Apparatus for programming a plurality of different radios with respectively different commands from a common programming source, each of said radios having a stored symbol identifying the radio and a memory storing commands representing its operating radio characteristics, said apparatus for programming a desired one of said different radios with a given set of commands comprising: means for interrogating said given radio to read its stored symbol, means responsive to a read symbol representing only said desired radio for reading the commands stored in said memory and for modifying said read commands to correspond to said given commands, means to store said modified commands in said radio memory, and means to confirm the accuracy of said stored modified commands including (a) means to read the stored modified commands and to compare them with said given commands at said source, and (b) means for providing a signal in response to said comparison.

4,525,866
STACK MEMORY TUNING

Frank C. Templin, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 7, 1983, Ser. No. 549,695
Int. Cl.³ H04B 1/16
U.S. Cl. 455—186 **10 Claims**

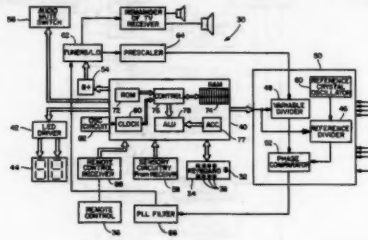
1. A system for tuning a television receiver, comprising:

a viewer operable channel number selection means for selectively generating a plurality of signals each representing a respective channel number;

current memory means responsive to operation of the channel number selection means for temporarily storing the currently selected channel number;

stack memory means comprising a plurality of sequential memory locations which are programmed for storing a plurality of preferred channel numbers in response to viewer operation of said channel number selection means by shifting in a given direction the contents of each memory location thereby vacating at least one memory location and storing the contents of the current memory means in the thus vacated memory location;

viewer operable channel scanning means for scanning said stack memory means for identifying the next higher or next lower channel number stored therein relative to the



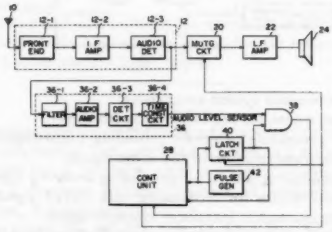
channel number stored in said current memory means and for replacing the contents of the current memory means with the thus identified channel number; and

tuning means responsive to the contents of said current memory means for tuning said television receiver to the channel number stored therein.

4,525,867
RADIO RECEIVER

Yuji Shiratani, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 288,366, Jul. 30, 1981, abandoned. This application Jan. 26, 1983, Ser. No. 461,977
Claims priority, application Sweden, Jul. 30, 1980, 8104602; Japan, Aug. 4, 1980, 55-108556; Aug. 4, 1980, 55-108567; Fed. Rep. of Germany, Aug. 4, 1981, 3130864
Int. Cl.³ H04B 1/10, 1/26
U.S. Cl. 455—194 **3 Claims**



1. A radio receiver comprising: an antenna for inducing a signal thereon; a tuner means which is supplied with said signal from said antenna; a muting circuit electrically coupled to said tuner means to mute an output from said tuner means in response to a command muting signal supplied thereto; an audio level sensor means for sensing an audio level of an audio analog signal resulting from said output from said tuner means, said audio level sensor means being responsive to the sensed audio level of said audio analog signal which is not higher than a predetermined magnitude so as to deliver an audio level sensed signal; and AND gate having one input connected to said audio level sensor means; a pulse generator means for generating timing pulses at predetermined constant equal time intervals, said timing pulses acting as said command muting signal; a latch circuit connected to said pulse generator means to latch therein said timing pulses from said pulse generator means, said latch circuit having its output connected to another input of said AND gate; and a control unit connected to outputs of said AND gate, said latch circuit and said pulse generator means,

said control unit having its output connected to both said latch circuit and said muting circuit; wherein said latch circuit puts said command muting signal from said pulse generator means in a standby state, and said AND gate is responsive to the reception of said audio level sensed signal from said audio level sensor means so as to generate a signal for releasing said command muting signal from said standby state so as to thereby cause said control unit to supply said command muting signal to said muting circuit and to also reset said latch circuit.

4,525,868

INTERFERENCE WAVE DETECTION CIRCUIT FOR USE IN RADIO RECEIVER

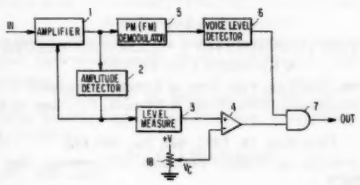
Kouzou Kage, Tokyo, and Hiroshi Watanabe, Miyagi, both of Japan, assignors to Nippon Electric Co., Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 478,119

Claims priority, application Japan, Mar. 23, 1982, 57-44671; Mar. 23, 1982, 57-44672; Mar. 23, 1982, 57-44673; Mar. 23, 1982, 57-44674

Int. Cl.³ H04B *1/10, 1/16*

U.S. Cl. 455—206 **17 Claims**



1. An interference wave detection circuit comprising:

amplifier means for amplifying a received carrier wave in response to a control signal;

amplitude detector means for amplitude-detecting the output of said amplifier means;

means for supplying the output of said amplitude detector means to said amplifier means as said control signal so as to make the output level of said amplifier means constant;

level measuring means for measuring the level of the output fluctuation of said amplitude detector means;

comparator means for comparing the output level of said level measuring means with a predetermined level to provide a compared output as an interference wave detection signal to the output of said interfence wave detection circuit;

discriminating means connected to the output of said amplifier means for judging whether said received carrier wave is modulated or not; and

gate means responsive to the output of said discriminating means for preventing said compared output from reaching to the output of said interference wave detection circuit when said discriminating means judges that said received carrier wave is modulated.

4,525,869

DIVERSITY RECEIVER

Masanori Hamada, and Sadao Ono, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,483

Claims priority, application Japan, Apr. 30, 1982, 57-73839

Int. Cl.³ H04B *7/08*

U.S. Cl. 455—277 **6 Claims**

1. A diversity receiver comprising:

a plurality of antennas;

antenna selecting means to which said antennas are connected;

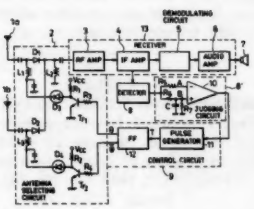
a receiver to which an antenna output from said antenna selecting means is applied;

detector means for detecting signal voltage responsive to said antenna output from an output of an intermediate frequency amplifier of said receiver;

judging means responsive to a signal voltage from said detector means for generating a judgement signal indicating whether receiving condition of the one of said antennas in use is good or not;

control means for actuating said antenna selecting means so as to select one of said antennas which is in a better receiving condition;

said judging means having a comparator and a time constant



circuit, said comparator having two input terminals connected to an output of said detector means by two respective paths, said time constant circuit being connected between one of said paths and ground; wherein said antenna selecting means includes diodes connected between respective outputs of said antennas and an input of said receiver, a voltage supply connected to inputs of said diodes for biasing said diodes conductive for conducting the output from their respective antennas to said receiver input, and means connectir , respective transistors to said inputs of said diodes, said control means having means actuable for alternatively clamping said diodes nonconductive by rendering conductive the corresponding transistor.

4,525,870

AUTOMOTIVE RADIO RECEIVER WITH RADIO FREQUENCY INTERFERENCE ELIMINATION CIRCUIT

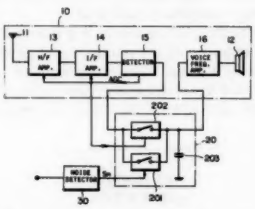
Hiroshige Fukuhara, and Norio Fujiki, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 19, 1982, Ser. No. 399,688

Claims priority, application Japan, Jul. 20, 1981, 56-112344; Aug. 27, 1981, 56-134477; Nov. 27, 1981, 56-190087

Int. Cl.³ H04B *1/10*

U.S. Cl. 455—297 **10 Claims**



1. A radio frequency interference elimination device in an automotive radio receiver comprising

a radio circuit for receiving a radio broadcasting signal suitable for audio reproduction;

a noise detector for detecting radio frequency interference

noise due to automotive electric circuits, said detector being electrically connected to power source wiring to receive radio frequency interference noise therefrom and produce a detector signal when said noise is detected; and

a radio frequency interference elimination circuit disposed within said radio circuit and responsive to said detector signal to hold said radio broadcasting signal level at an immediately preceeding level for a given period of time and outputting the held level of radio broadcasting signal for reproduction, said radio frequency interference elimination circuit including first and second switches and a capacitor, said first switch being connected to said noise detector to open in response to said detector signal and said second switch being connected to an automatic gain control circuit to open while the inputted radio broadcasting signal level is lower than an automatic gain control reference level, and said capacitor adapted to be charged by the radio broadcasting signal level.

4,525,871

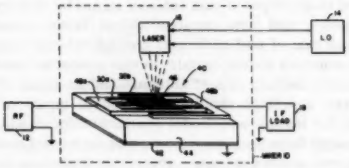
HIGH SPEED OPTOELECTRONIC MIXER

Arthur G. Foyt; Frederick J. Leonberger, both of Lexington, and Richard C. Williamson, Sudbury, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 3, 1982, Ser. No. 345,228

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—325 **3 Claims**



1. An optoelectronic mixer comprising:

(a) a substrate with planar conducting electrodes on a surface thereof;

(b) one of said planar conducting electrode structures having a non-conducting space providing a non-conductive gap on said surface and adapted to be illuminated by photons from a photon source which generates a photon beam controlled by a first source of oscillatory electrical signals whereby a photo-generated plasma forms a conducting path across the gap in accordance with such oscillatory signals thereby periodically completing an electrical circuit between:

(i) a second source of oscillatory electrical signals adapted to be coupled to one side of said electrode and

(ii) a utilization device adapted to be coupled to another of said conducting electrodes;

(c) the product of said first and second oscillatory signals being thereby coupled to said load;

(d) and wherein the photon source is a laser which is biased so that the intensity of the photon beam produced by the laser varies in a linear fashion throughout its operating range such that the mixer is operated in the bilinear mode such that the first and second signals are mixed in a linear fashion.

4,525,872

AMPLIFIER

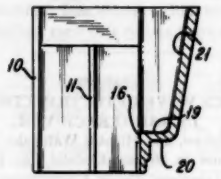
John S. Zochowski, 118 Palmer St., Jamestown, N.Y. 14701

Filed Jun. 27, 1983, Ser. No. 508,012

Int. Cl.³ H04B *1/08*

U.S. Cl. 455—344 **2 Claims**

1. An accessory for a personal paging device adapted to be worn below ear level by a user, said device having a case of generally rectangular cross section containing radio receiving apparatus including a speaker for emitting an audio paging signal and a grille in an upper part of an outer side wall of the case through which the signal is emitted, said accessory comprising an open ended member of generally rectangular cross section slidably fitting over said case, the lower end of said



member fitting tightly against the said outer side wall below and adjacent said grille, and said member having a wall opposite and spaced outwardly from said grille diverging outwardly and upwardly at an acute angle to said outer side wall for increasing the intensity of the sound at ear level of the paging signals emitted from the upper end of said accessory.

4,525,873

DEVICE FOR TRANSMITTING MEASURED VALUES TO A REMOTE LOCATION

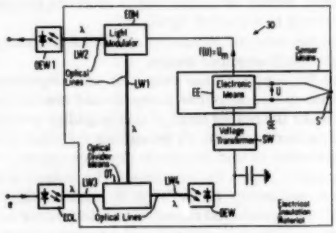
Peter Baues, Krailling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,155

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138073

Int. Cl.³ H04B *19/00*

U.S. Cl. 455—600 **28 Claims**



1. In a device for transmitting measured values of a measured condition from a test location to a remote location, said device comprising sensor means for testing a condition to be measured and creating an electrical output signal dependent on the value of the condition, said sensor means requiring electrical energy for operation and having electrical parts and at least one sensor element for creating an electrical signal which is dependent on the measured values, and means for communicating the electrical output signal to a remote location, the improvements comprising the means for communicating including a modulator means being disposed adjacent the sensor means for receiving the electrical output signal of the sensor means and modulating light into a light signal in response to the electrical output signal, a first optical line for conveying light to the modulator means, a second optical line for conveying the light signal from the modulator means back to a location remote from the sensor means; said sensor means including electronic means for converting the electrical signal of the sensor element into an electrical output signal for operating the modulator means by creating an output voltage of an alternating voltage whose frequency is modulated by the electrical

signal of the sensor element; said device including means for supplying light energy to the first optical line and electrical energy to the sensor means including means for forming a light source at a position remote to the sensor means, a voltage transformer, an electrical rechargeable storage device being connected to the voltage transformer, transducer means being disposed adjacent the sensor means for converting light into electrical energy for operation of the electrical parts of the sensor means, said transducer means being connected to the sensor means by the voltage transformer, optical means for dividing an incoming beam of light into two output beams of light being positioned adjacent the transducer means and sensor means, one of the two output beams being connected to the first optical line, a third optical line extending from said means for forming a light source to the optical means, and a fourth optical line extending from said optical means to the transducer means to supply the other of the two output beams to the transducer means; and said device including structural means to encapsulate the modulator means, the voltage transformer, the storage device, the transducer means and the sensor means in an electrical insulation material with only the sensor element being accessible from the exterior of the structural means.

4,525,874

DEVICE FOR TRANSMITTING MEASURED VALUES TO A REMOTE LOCATION

Peter Baües, Krailling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

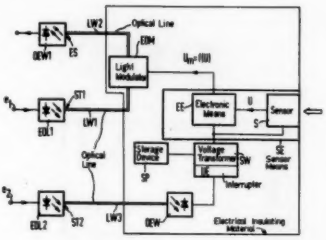
Filed Aug. 18, 1982, Ser. No. 409,156

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138074

Int. Cl.³ H04B 9/00

U.S. Cl. 455—600 **23 Claims**

1. In a device for transmitting measured values of a measured condition from a test location to a remote location, said device comprising sensor means for testing a condition to be measured and creating an electrical output signal dependent on the value of the condition, said sensor means requiring electrical energy for operation and including electrical parts and at least one sensor element for creating an electrical signal which is dependent on the measured values, and means for communicating the electrical output signal to a remote location, the improvements comprising the means for communicating including a modulator means being disposed adjacent the sensor means for receiving the electrical output signal of the sensor means and modulating light into a light signal in response to the electrical output signal, a first source of light positioned at the remote location, a first optical line for conveying light from said first source to the modulator means, a second optical line for conveying the light signal from the modulator means back to a location remote from the sensor means, said sensor means including electronic means for converting the electrical signal of the sensor element into an electrical output signal for operating the modulator means by creating an output voltage of an alternating voltage whose frequency is modulated by the electrical signal of the sensor element; said device including means

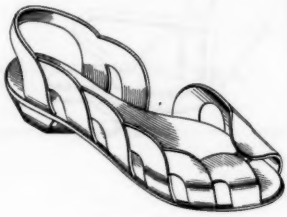


for supplying electrical energy to the sensor means including a second light source at a position remote to the sensor means, a voltage transformer, an electrical rechargeable storage device being connected to the voltage transformer, transducer means being disposed adjacent the sensor means and being connected to the sensor means through the voltage transformer for converting light into electrical energy for operation of the electrical parts of the sensor means, and a third optical line extending from said light source to the transducer means; and said device including structural means to encapsulate the modulator means, the voltage transformer, the storage device, the transducer means and the sensor means in an electrical insulating material with only the sensor element being accessible from the exterior of the structural means.

DESIGNS

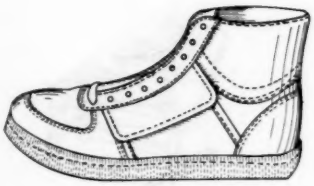
JUNE 25, 1985

279,325
SHOE AND THE LIKE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear, Co., West Hazleton, Pa.
Filed Nov. 15, 1984, Ser. No. 671,869
Term of patent 14 years
U.S. Cl. D2—282

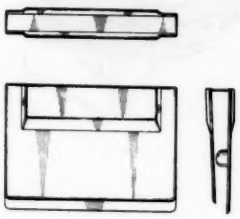


279,326
SHOE AND THE LIKE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear, Co., West Hazleton, Pa.
Filed Oct. 31, 1984, Ser. No. 666,780
Term of patent 14 years
U.S. Cl. D2—298

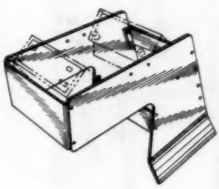
279,327
ATHLETIC BOOT WITH POCKET
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A. Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 107,093, Dec. 26, 1979, Pat. No. Des. 261,823, and Ser. No. 297,838, Aug. 28, 1981,. This application Oct. 23, 1981, Ser. No. 314,137
Term of patent 14 years
U.S. Cl. D2—310



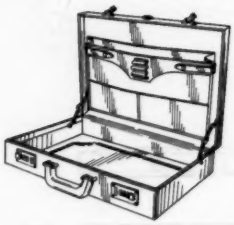
279,328
CASSETTE HOLDER OR SIMILAR ARTICLE
Shigeru Shimmi, 26-11, Kamiishihara 1-chome,, Chofu-shi, Tokyo, and Akiko Kimura, 17-24, Meguro 4-Chome, Meguro-ku, Tokyo, both of Japan
Filed Feb. 17, 1982, Ser. No. 349,486
Term of patent 14 years
U.S. Cl. D3—35



279,329
SUPPORT FOR MOUNTING RADIOS IN A VEHICLE HAVING BENCH SEATS
Stephen Dzak, 414 Muir Dr., Joliet, Ill. 60441
Filed Sep. 24, 1982, Ser. No. 422,983
Term of patent 14 years
U.S. Cl. D3—40



279,330
COMBINED ATTACHE CASE AND TRAVELLING DESK
Edward L. Gerch, 1228 Emerson St., Evanston, Ill. 60201
Filed Jan. 24, 1983, Ser. No. 460,277
Term of patent 14 years
U.S. Cl. D3—76



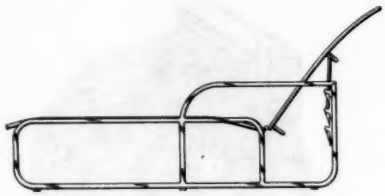
279,331
CHAIR
Jeremy N. Griffith, Clothiers Creek Rd., Condong, Via Murwillumbah, New South Wales, Australia (2484)
Filed Jun. 1, 1982, Ser. No. 383,933
Claims priority, application Australia, Mar. 2, 1982, 86647
Term of patent 14 years
U.S. Cl. D6—379

279,332
COMBINED SEAT AND BACKREST UNIT FOR AN OFFICE CHAIR
Niels Diffrient, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Filed Jun. 11, 1979, Ser. No. 47,122
Term of patent 14 years
U.S. Cl. D6—379

279,333
CONVERTIBLE CRADLE
Kenneth T. Brown, and Virginia W. Brown, both of 1459 Willard St., San Francisco, Calif. 94117
Filed Sep. 29, 1982, Ser. No. 426,762
Term of patent 14 years
U.S. Cl. D6—335

279,334
A COMBINED STRADDLE SEAT AND ARM REST
Richard P. Agan, 2812 47th St., Des Moines, Iowa 50310, and Anna L. Dunahoo, 3914 E. 8th St., Des Moines, Iowa 50316
Filed Feb. 7, 1983, Ser. No. 436,609
Term of patent 14 years
U.S. Cl. D6—354

279,335
CHAISE FRAME
Richard Frinier, Longbeach, and Eugene A. Criqui, Covina, both of Calif., assignors to Brown Jordan Company, El Monte, Calif.
Filed Jul. 21, 1982, Ser. No. 400,316
Term of patent 14 years
U.S. Cl. D6—361

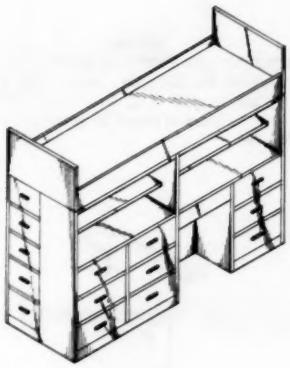


279,336
CHAIR
Andrew Duncan, Canterbury, Australia, assignor to Pluto Furniture (Sales) Pty. Ltd., Victoria, Australia
Filed Aug. 27, 1982, Ser. No. 412,189
Term of patent 14 years
U.S. Cl. D6—368

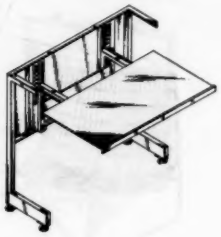
279,337
CHAIR
Noboru Nakamura, Sapporo, Japan, assignor to Mohly Shop Co., Ltd., Osaka, Japan
Filed Sep. 30, 1982, Ser. No. 430,273
Claims priority, application Japan, Apr. 22, 1982, 57-17614
Term of patent 14 years
U.S. Cl. D6—371

279,338
CHAIR
Giovanni Offredi, Via Ludovico Muratori 29, Milano, Italy
Filed Mar. 10, 1983, Ser. No. 473,875
Claims priority, application Italy, Sep. 17, 1982, 60949B/82
Term of patent 14 years
U.S. Cl. D6—376

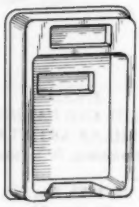
279,339
COMBINED LOFT BED AND CABINET ASSEMBLY OR SIMILAR ARTICLE
Stefano Testa, New Providence, N.J., assignor to Essex Chair Company, Union, N.J.
Filed Jan. 24, 1983, Ser. No. 460,308
Term of patent 14 years
U.S. Cl. D6—384



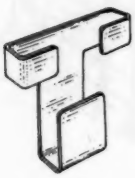
279,340
ADJUSTABLE STAND FOR A COMPUTER KEYBOARD OR THE LIKE
Francis Spear, Conklin, N.Y., assignor to Systems Manufacturing Corporation, Binghamton, N.Y.
Filed Aug. 12, 1982, Ser. No. 407,607
Term of patent 14 years
U.S. Cl. D6—429



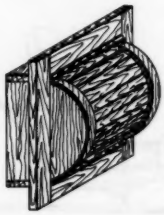
279,341
STACKABLE TRAY FOR DISPLAYING AND DISPENSING CYLINDRICAL PACKAGED ARTICLES
Richard J. Simmons, Carol Stream, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.
Filed Aug. 2, 1982, Ser. No. 404,581
Term of patent 14 years
U.S. Cl. D6—466

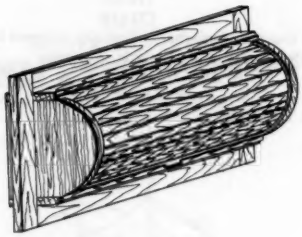


279,342
HOLDER FOR EMPTY CASSETTE CASE
John W. Crawford, 461 Siesta Dr., Aptos, Calif. 95003
Filed Nov. 22, 1982, Ser. No. 443,304
Term of patent 14 years
U.S. Cl. D6—466

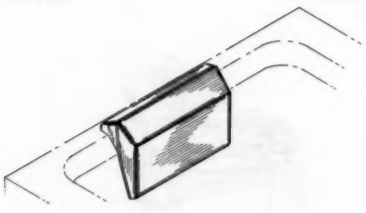


279,343
PAPER ROLL HOLDER
Gerald E. Brewster, 6464 Via Venado, San Luis Obispo, Calif. 93401
Filed Jan. 10, 1983, Ser. No. 456,567
Term of patent 14 years
U.S. Cl. D6—522

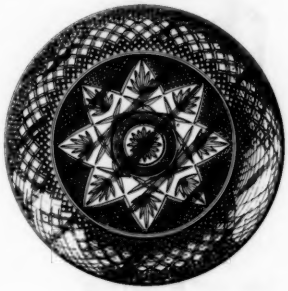




279,344
BATHTUB PILLOW
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1983, Ser. No. 458,631
Term of patent 14 years
U.S. Cl. D6—596

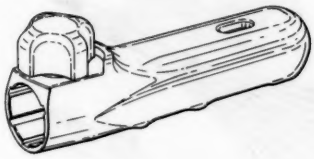


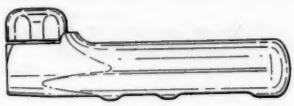
279,345
PLATE OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed Aug. 26, 1982, Ser. No. 411,979
Claims priority, application Hague, May 24, 1982, Hague
Term of patent 14 years
U.S. Cl. D7—28



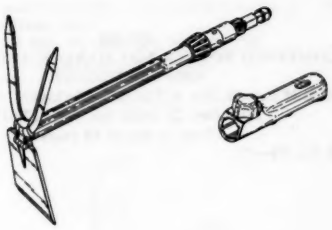
279,346
JUG
Craig Ruxton, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Aug. 18, 1982, Ser. No. 409,078
Term of patent 14 years
U.S. Cl. D7—77

279,347
GRIP FOR GARDEN UTENSILS
Franco Clivio, Ulm, and Dieter Raffler, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Gardena Kress+Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 17, 1983, Ser. No. 467,391
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, GRA III 1354/82
Term of patent 14 years
U.S. Cl. D8—1

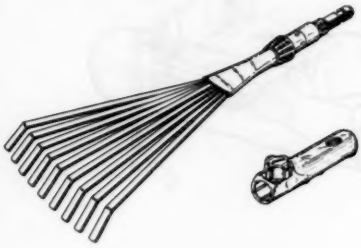




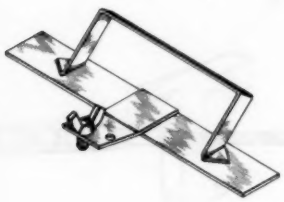
279,348
GARDEN UTENSIL
Franco Clivio, Ulm, and Dieter Raffler, Neu-Ulm, both of Fed. Rep. of Germany, assignors to GARDENA Kress+Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 17, 1983, Ser. No. 467,381
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, GRA III 1354/82
Term of patent 14 years
U.S. Cl. D8—11



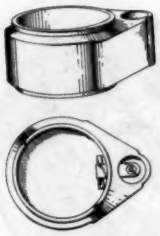
279,349
GARDEN RAKE
Franco Clivio, Ulm, and Dieter Raffler, Neu-Ulm, both of Fed. Rep. of Germany, assignors to GARDENA Kress+Kastner GmbH, Fed. Rep. of Germany
Filed Feb. 17, 1983, Ser. No. 467,388
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 135482
Term of patent 14 years
U.S. Cl. D8—13



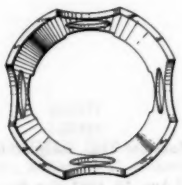
279,350
COMBINED ROCKER BOX HANDLE AND ROCKER ARM POSITIONER
George Hamatani, Rte. 1, Box 400, Clarksburg, Calif. 95612
Filed Oct. 25, 1982, Ser. No. 437,417
Term of patent 14 years
U.S. Cl. D8—71

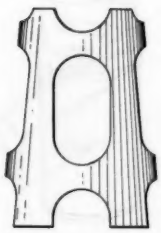


279,351
TRAILER KING PIN LOCK
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Filed Jun. 2, 1982, Ser. No. 500,576
Term of patent 14 years
U.S. Cl. D8—331

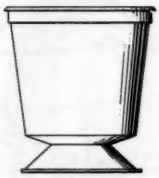


279,352
CONCRETE REINFORCING ROD SPACER
Diana L. Mitchell, and Howard Hewitt, both of #240-1107 Homer St., Vancouver, B.C. V6B 2Y1, Canada
Filed Jun. 19, 1984, Ser. No. 622,166
Term of patent 14 years
U.S. Cl. D8—354



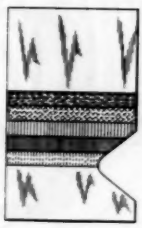


279,353
PACKAGING CUP WITH A PEDESTAL BASE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Oct. 15, 1982, Ser. No. 434,700
Term of patent 14 years
U.S. Cl. D9—349

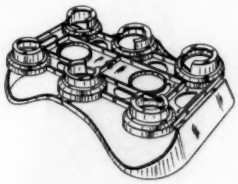


279,354
BOTTLE OR THE LIKE
Paul Marcus, 85 Pascack Rd., Pearl River, N.Y. 10965
Filed Mar. 10, 1983, Ser. No. 473,778
Term of patent 14 years
U.S. Cl. D9—351

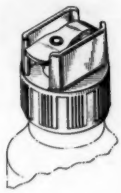
279,355
PACKING BOX FOR VIDEO CASSETTES
Masumi Ujiie, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 19, 1983, Ser. No. 459,200
Claims priority, application Japan, Jul. 19, 1982, 57-32631
Term of patent 14 years
U.S. Cl. D9—432



279,356
BOTTLE CARRIER
James F. Moss, Tulsa, Okla., assignor to Liberty Glass Company, Sapulpa, Okla.
Filed Sep. 24, 1982, Ser. No. 422,958
Term of patent 14 years
U.S. Cl. D9—434



279,357
BOTTLE CAP
David W. Mitchell, Orange, Calif., assignor to Allergan Pharmaceuticals, Inc., Irvine, Calif.
Filed May 20, 1983, Ser. No. 496,753
Term of patent 14 years
U.S. Cl. D9—450

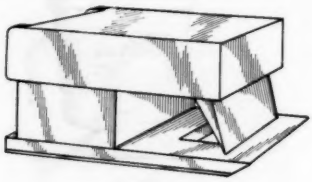


279,358
GROWTH CHART
Larry A. Lichtman, Northridge, Calif., assignor to Sunset Time, Inc., Mission Hills, Calif.
Filed Jun. 27, 1983, Ser. No. 507,770
Term of patent 14 years
U.S. Cl. D10—71

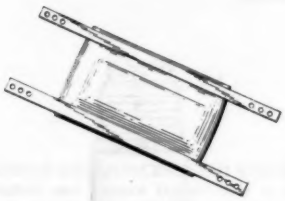
279,359
WRISTWATCH CASE FACE AND KNOB
Elemér Szigeti, 1, Place Eugene Mo, 06000 Nice (Alpes Maritimes), France
Filed Jan. 15, 1982, Ser. No. 339,553
Term of patent 14 years
U.S. Cl. D10—126

279,360
JEWELRY PIN
Louis H. Hubachek, 24524 Cypress Ave., Lomita, Calif. 90717
Filed Apr. 7, 1983, Ser. No. 482,788
Term of patent 14 years
U.S. Cl. D11—71

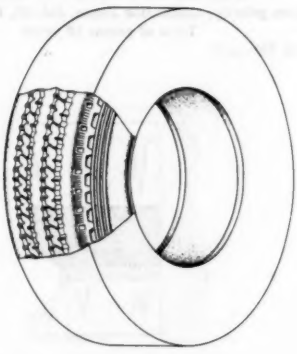
279,361
ICE FISHING SLED
Kenneth T. Peckels, 1678 Hillview Rd., Shoreview, Minn. 55112, and William M. Peckels, 414 36th Ave. N., Minneapolis, Minn. 55412
Filed May 10, 1982, Ser. No. 376,394
Term of patent 14 years
U.S. Cl. D12—9



279,362
CHAIR RESTRAINING DEVICE
John B. Sink, 3729 Rolling Rd., High Point, N.C. 27260
Filed Jun. 7, 1982, Ser. No. 385,550
Term of patent 14 years
U.S. Cl. D12—133



279,363
TIRE FOR A VEHICLE WHEEL
Tetsuhiro Fukumoto, Akashi, and Kiyoshi Ochiai, Nishinomiya, both of Japan, assignors to Dunlop Limited, London, England
Filed Nov. 10, 1982, Ser. No. 440,557
Claims priority, application Japan, Jul. 23, 1982, 57-33526
Term of patent 14 years
U.S. Cl. D12—143



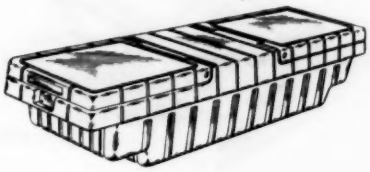
279,364
VEHICLE TIRE
Haruo Kusube, Toyota, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 5, 1983, Ser. No. 510,903
Term of patent 14 years
U.S. Cl. D12—146

279,365
VEHICLE TIRE
Kenji Takehara, Amagasaki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 22, 1983, Ser. No. 487,668
Term of patent 14 years
U.S. Cl. D12—147

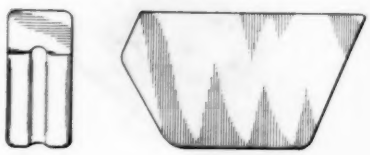
279,366
VEHICLE TIRE
Kenji Takehara, Amagasaki, Japan, assignor to Sumitomo Rubber Industries, Inc., Hyogo, Japan
Filed Apr. 22, 1983, Ser. No. 487,669
Term of patent 14 years
U.S. Cl. D12—147

279,367
TIRE TREAD AND BUTTRESS
Daniel J. Lindner, Canal Fulton; Ronald L. Loeffler, Akron, both of Ohio; Harold D. Fetty, Asheville, N.C., and Jeffrey L. Plauny, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sep. 26, 1983, Ser. No. 536,045
Term of patent 14 years
U.S. Cl. D12—149

279,368
TRUCK TOOL BOX
John E. Waters, Waco, Tex., assignor to Advanced Plastics, Inc., Jonesboro, Ark.
Continuation-in-part of Ser. No. 516,776, Jul. 25, 1983,. This application Dec. 28, 1983, Ser. No. 566,262
Term of patent 14 years
U.S. Cl. D12—157

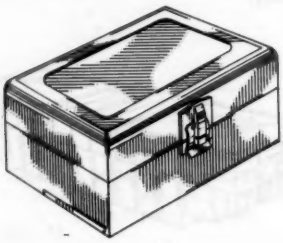


279,369
UTILITY BOX FOR BICYCLES
Gary Van Vlandren, 15 Duchess Ave., South Burlington, Vt. 05401
Filed Oct. 25, 1983, Ser. No. 545,170
Term of patent 14 years
U.S. Cl. D12—158

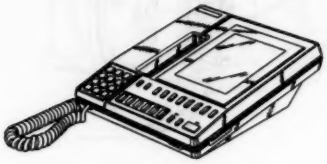


279,370
SHOCK ABSORBER
Julius R. Ballew, Plateau Heights, Seminole, Tex. 79360
Filed Sep. 29, 1982, Ser. No. 428,373
Term of patent 14 years
U.S. Cl. D12—159

279,371
PHONOGRAPH
Galen C. Arrington, 4535 E. Beverly La., Phoenix, Ariz. 85032; Allen E. Christ; Theodore W. Keller, both of Scottsdale, Ariz., and Clark W. Eichhorn, Phoenix, Ariz., assignors to Galen C. Arrington, Phoenix, Ariz.
Filed Feb. 22, 1983, Ser. No. 468,065
Term of patent 14 years
U.S. Cl. D14—16

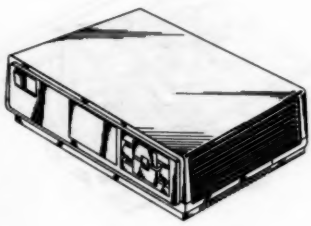


279,372
TELEPHONE ANSWERING MACHINE WITH HANDSET
Haruo Baba, Kanagawa; Teisuke Kurosu, Tokyo; Fumiharu Ohta, Kanagawa; Kazumasa Takenaka, Kanagawa, and Satoshi Watanabe, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan
Filed Nov. 1, 1982, Ser. No. 438,231
Claims priority, application Japan, May 17, 1982, 57-21563
Term of patent 14 years
U.S. Cl. D14—52

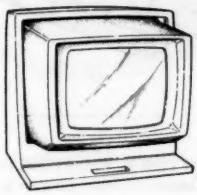


279,373
TELEPHONE
Eric J. Marshall, London, England, assignor to Eric Marshall Associates Limited, England
Filed Oct. 21, 1982, Ser. No. 435,868
Claims priority, application United Kingdom, Apr. 21, 1982, 1006301
Term of patent 14 years
U.S. Cl. D14—53

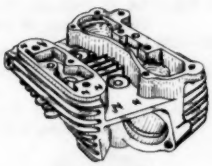
279,374
COMPUTER HOUSING
Paul E. Benigni, Bridgewater; Steven G. Boulay, Dudley, and John C. Costello, Newton Center, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Aug. 9, 1982, Ser. No. 406,479
Term of patent 14 years
U.S. Cl. D14—100

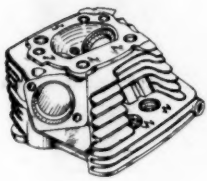


279,375
CRT DISPLAY CABINET
Donald M. Genaro, Haworth, and Alvin R. Tilley, Red Bank, both of N.J., assignors to AT&T Teletype Corporation, Skokie, Ill.
Filed Oct. 8, 1982, Ser. No. 433,605
The portion of the term of this patent subsequent to Jan. 24, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—113

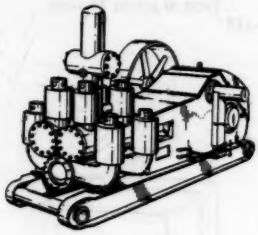


279,376
MOTORCYCLE ENGINE HEAD
William G. Davidson, Elm Grove, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Oct. 3, 1983, Ser. No. 538,228
Term of patent 14 years
U.S. Cl. D15—5

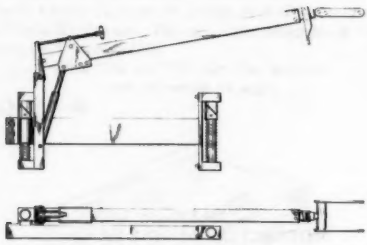




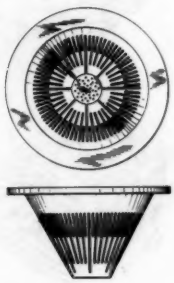
279,377
DUPLEX MUD PUMP
Walter Kuchar, Edmonton, Canada, assignor to Tri-Service Machine Ltd., Edmonton, Canada
Filed May 14, 1982, Ser. No. 378,193
Term of patent 14 years
U.S. Cl. D15—7



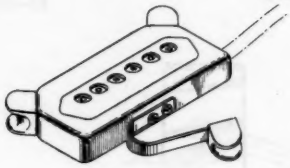
279,378
BALANCE ARM FOR SUPPORTING WORKING TOOLS
Bertil Larsson, Ödsmål, Sweden, assignor to Stalvall & Larsson Forsaljnings AB., Odsmal, Sweden
Filed Dec. 6, 1982, Ser. No. 447,310
Claims priority, application Sweden, Jun. 9, 1982, 82-1511
Term of patent 14 years
U.S. Cl. D15—138



279,379
MOLTEN METALS FILTER
Stuart Z. Uram, Alpine, N.J., assignor to Certech Incorporated, Wood-Ridge, N.J.
Filed Oct. 22, 1982, Ser. No. 435,982
Term of patent 14 years
U.S. Cl. D15—138

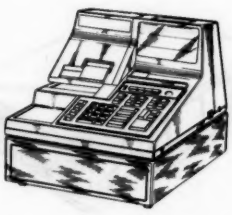


279,380
ACOUSTIC PICKUP FOR STRINGED INSTRUMENT
Willi L. Stich, 110 Tyne Blvd., Old Hickory, Tenn. 37138
Filed Feb. 9, 1983, Ser. No. 465,429
Term of patent 14 years
U.S. Cl. D17—20



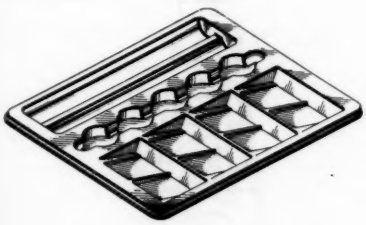
279,381
CALCULATOR RULER OR SIMILAR ARTICLE
Chee-Chun Leung, Taipei, Taiwan, assignor to Cal-Comp Electronice, Inc., Taipei, Taiwan
Filed May 31, 1983, Ser. No. 499,516
Claims priority, application Taiwan, Jan. 19, 1983, 7230311
Term of patent 14 years
U.S. Cl. D18—2

279,382
CASH REGISTER OR SIMILAR ARTICLE
Susumu Hori; Shinichi Kaneko, both of Kawasaki, and Hiroaki Suzuki, Yokohama, all of Japan, assignors to The General Corporation, Kawasaki, Japan
Filed Jun. 2, 1982, Ser. No. 384,265
Claims priority, application Japan, Dec. 2, 1981, 56-53476
Term of patent 14 years
U.S. Cl. D18—4

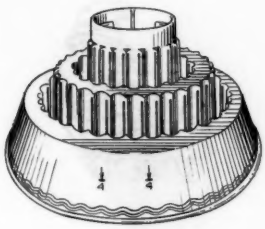


279,383
BALL POINT WRITING INSTRUMENT
Thomas W. Hillebrand, and Clemens A. Sonntag, both of Janesville, Wis., assignors to Parker Pen Company, Janesville, Wis.
Filed Sep. 6, 1983, Ser. No. 529,409
Term of patent 14 years
U.S. Cl. D19—51

279,384
DRAWER INSERT FOR A DESK STORAGE TRAY SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Nov. 22, 1982, Ser. No. 443,184
Term of patent 14 years
U.S. Cl. D19—75



279,385
DRAWING IMPLEMENT STORAGE DEVICE
Sheldon Lieberman, Allentown, Pa., assignor to Binney & Smith, Easton, Pa.
Filed Sep. 28, 1982, Ser. No. 426,223
Term of patent 14 years
U.S. Cl. D19—77

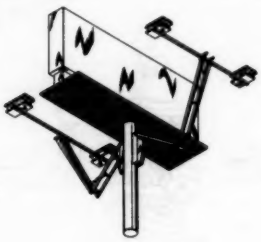


279,386
PARTY NEEDS MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,628
Term of patent 14 years
U.S. Cl. D19—91

279,387
MENU MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,626
Term of patent 14 years
U.S. Cl. D19—91

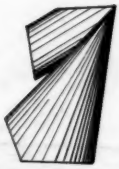
279,388
INVITATION LIST MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,630
Term of patent 14 years
U.S. Cl. D19—91

279,389
BILLBOARD DISPLAY APPARATUS
Thomas B. Douglas, and A. Clark Dunklin, both of 4510 N. Central, Dallas, Tex. 75206
Filed Nov. 16, 1983, Ser. No. 552,475
Term of patent 14 years
U.S. Cl. D20—39



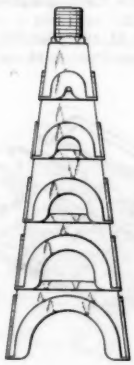
279,390
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60613
Filed Nov. 8, 1982, Ser. No. 439,834
Term of patent 14 years
U.S. Cl. D21—52

279,391
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60613
Filed Nov. 8, 1982, Ser. No. 439,833
Term of patent 14 years
U.S. Cl. D21—52

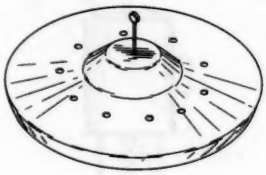


279,392
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60613
Filed Nov. 8, 1982, Ser. No. 439,835
Term of patent 14 years
U.S. Cl. D21—52

279,393
STACKING TOY
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 27, 1982, Ser. No. 453,704
Term of patent 14 years
U.S. Cl. D21—59



279,394
TOY FLYING SAUCER
Ernest G. Coleman, R.D. 4, Box 515M, Chestertown, Md. 21620
Filed Mar. 2, 1983, Ser. No. 471,448
Term of patent 14 years
U.S. Cl. D21—86



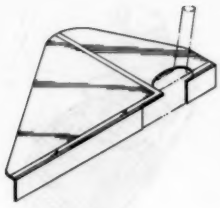
279,395
TOY TRACKWAY
Herbert Green, 2514 Fox Harbour Ct., Indianapolis, Ind. 46227
Filed Oct. 7, 1982, Ser. No. 433,420
Term of patent 14 years
U.S. Cl. D21—92

279,396
MINIATURIZED BASKETBALL BACKBOARD
Samuel F. Speers, 8341 W. Country Club Dr. N., Sarasota, Fla. 33580
Filed Nov. 22, 1982, Ser. No. 444,689
Term of patent 14 years
U.S. Cl. D21—201

279,397
TENNIS RACQUET
Carlo Gibello, Corso Vittorio Emanuele II, 5, Torino, Italy
Filed Jan. 12, 1983, Ser. No. 457,542
Claims priority, application Italy, Jul. 12, 1982, 53501/82[U]
Term of patent 14 years
U.S. Cl. D21—212

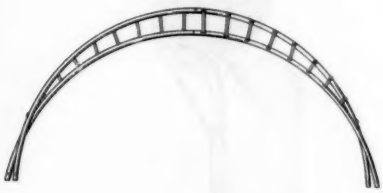
279,398
TENNIS RACQUET
Carlo Gibello, Corso Vittorio Emanuele II, 5, Torino, Italy
Filed Mar. 1, 1983, Ser. No. 471,085
Claims priority, application Italy, Sep. 1, 1982, 53643/82[U]
Term of patent 14 years
U.S. Cl. D21—212

279,399
PUTTING GUIDE GOLF CLUB ATTACHMENT
Helen V. Neumunz, 961 Soldier Hill Rd., Oradell, N.J. 07649
Filed Jul. 13, 1983, Ser. No. 513,321
Term of patent 14 years
U.S. Cl. D21—221

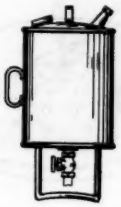


279,400
PORTABLE OUTDOOR BUMPER POOL TABLE
Edward G. Dunn, Sr., 7701 Spring Mill Rd., Indianapolis, Ind. 46260, and Edward G. Dunn, Jr., 136 E. 50th St., Indianapolis, Ind. 46205
Filed Sep. 30, 1982, Ser. No. 430,744
Term of patent 14 years
U.S. Cl. D21—232

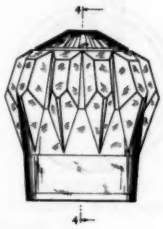
279,401
PLAYGROUND CLIMBER
Donald E. West, Fort Payne, Ala., assignor to Game Time, Inc., Fort Payne, Ala.
Filed Feb. 25, 1983, Ser. No. 469,806
Term of patent 14 years
U.S. Cl. D21—245



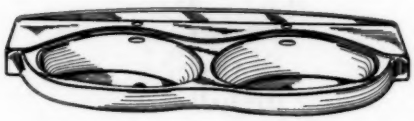
279,402
COMBINED STAND AND CONTAINER FOR STORING AND DISPENSING GASOLINE OR THE LIKE
Charles C. Gibson, Rte. 4, Box 281, Hurricane, W. Va. 25526
Filed Jul. 9, 1982, Ser. No. 396,887
Term of patent 14 years
U.S. Cl. D23—2



279,403
FAUCET HANDLE
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed May 20, 1983, Ser. No. 496,804
Term of patent 14 years
U.S. Cl. D23—28

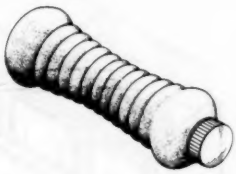


279,404
LAVATORY OR SIMILAR ARTICLE
Dorothee Hiller, Stuttgart, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 65,674, Aug. 10, 1979. This application Dec. 10, 1980, Ser. No. 214,928
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 20 MR 1848
Term of patent 14 years
U.S. Cl. D23—62

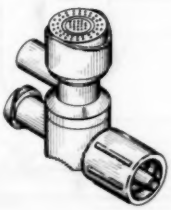


279,405
COMEDONE EXTRACTOR
William C. Lentz, 13931 Squaw Creek Dr., Ft. Wayne, Ind. 46804
Filed Nov. 1, 1982, Ser. No. 438,340
Term of patent 14 years
U.S. Cl. D24—23

279,406
MASSAGE ROLLER
Desmond K. Shiu, Boston, Mass., assignor to Matrix International Industries, Boston, Mass.
Filed Sep. 27, 1982, Ser. No. 423,884
Term of patent 14 years
U.S. Cl. D24—36

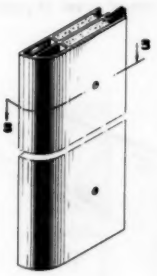


279,407
CATHETER FLUSH FLOW CONTROL DEVICE
James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Buffalo, N.Y.
Filed Apr. 26, 1982, Ser. No. 371,657
Term of patent 14 years
U.S. Cl. D24—53



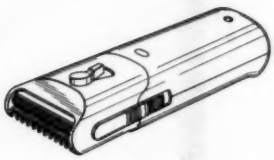
279,408
FOOD SERVICE BUILDING
Robert M. Davenport, and Cecil R. Cheek, both of Lookout Mountain, Tenn., assignors to Robert M. Davenport Company, Chattanooga, Tenn.
Filed Jan. 25, 1983, Ser. No. 460,931
Term of patent 14 years
U.S. Cl. D25—25

279,409
COMBINED SMOKE GASKET AND INTUMESCENT EXPANDING SEAL DEVICE FOR SLIDING ELEVATOR DOORS AND THE LIKE
George A. Allen, Jr., 3601 Old Gun Rd., Midlothian, Va. 23113
Filed Nov. 23, 1982, Ser. No. 444,687
Term of patent 14 years
U.S. Cl. D25—74



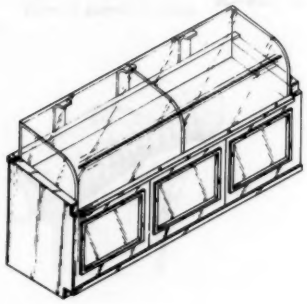
279,410
GARDEN LIGHTING FIXTURE
Imero Fiorentino, and William G. Marshall, both of New York, N.Y., assignors to Imero Fiorentino Associates, Inc., New York, N.Y.
Filed Dec. 29, 1980, Ser. No. 221,003
Term of patent 14 years
U.S. Cl. D26—69

279,411
ELECTRIC HAIR CLIPPER
Noboru Abe, Suita, Japan, and Florian Seiffert, Gründwald, Fed. Rep. of Germany, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Apr. 26, 1983, Ser. No. 488,766
Claims priority, application Japan, Dec. 20, 1982, 57-57028
Term of patent 14 years
U.S. Cl. D28—53



279,412
FINGERNAIL DRYER
May Fung, Hong Kong, Hong Kong, assignor to Etna Products Co., Inc., New York, N.Y.
Filed Oct. 22, 1984, Ser. No. 663,490
Claims priority, application United Kingdom, Jun. 22, 1984, 1020456
Term of patent 14 years
U.S. Cl. D28—58

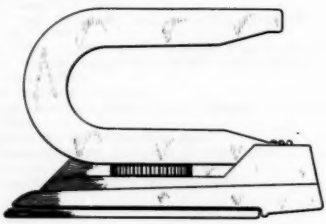
279,413
COMBINED DISPLAY CASE FISH TANK
Andrew Balducci, 7 Todd Ct., East Williston, N.Y.
Filed Jan. 24, 1983, Ser. No. 460,195
Term of patent 14 years
U.S. Cl. D30—11



279,414
EAR TAG FOR ANIMALS
Edward E. Dvorak, P.O. Box 79, Manning, N. Dak. 58642
Filed May 18, 1983, Ser. No. 495,682
Term of patent 14 years
U.S. Cl. D30—43

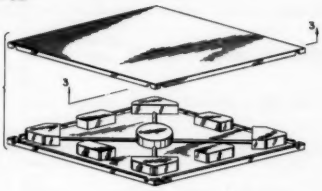
279,415
ILLUMINATED ICE SCRAPER
Harold Osrow, Dix Hills, and Richard Osrow, Kings Park, both of N.Y., assignors to Osrow Products Corporation, Old Bethpage, N.Y.
Filed Jun. 20, 1983, Ser. No. 505,943
Term of patent 14 years
U.S. Cl. D32—49

279,416
IRON
Bing Y. Chan, Kowloon, Hong Kong, assignor to Goodway Electrical Company Ltd., Kowloon, Hong Kong
Filed Dec. 22, 1982, Ser. No. 452,042
Claims priority, application United Kingdom, Jun. 29, 1982, 1007451
Term of patent 14 years
U.S. Cl. D32—69

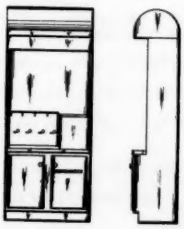


279,417
INFECTIOUS WASTE CONTAINER FOR USE IN HOSPITALS AND OTHER HEALTH CARE FACILITIES
Treesa A. Spencer, 2818 S. Diamond, Santa Ana, Calif. 92704
Filed Oct. 24, 1983, Ser. No. 544,507
Term of patent 14 years
U.S. Cl. D34—1

279,418
PALLET
Henry W. Helmer, 10 Colony Rd., Gretna, La. 70053
Filed Jan. 10, 1983, Ser. No. 457,044
Term of patent 14 years
U.S. Cl. D34—38



279,419
POSTAL CENTER UNIT
Max L. Stevens, and William P. Goeckeler, both of St. Louis County, Mo., assignors to 24 Hour Postal Center, Inc., St. Louis, Mo.
Filed Dec. 6, 1982, Ser. No. 446,952
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JUNE, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Salminen, Arvo, 4,524,900, Cl. 229-19.000.
Tikka, Kyosti, 4,524,901, Cl. 229-19.000.

A & E Systems, Inc.: *See*—
Greer, Bradley G., 4,524,791, Cl. 135-89.000.

A. Salvi & C. S.p.A.: *See*—
Diana, Giorgio, 4,525,596, Cl. 174-42.000.

A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H.: *See*—
Krempl, Peter W.; and Schindler, Wolfgang, 4,525,627, Cl. 250-345.000.

AAKAC Industries Inc.: *See*—
Williams, John E., Jr., 4,524,844, Cl. 180-219.000.

Abbey, Kirk J.; and Erickson, James R., to SCM Corporation. Cathodic electrocoating composition compounded with latex binder and possessing enhanced gloss. 4,525,260, Cl. 204-181.700.

Abe, Kazunori: *See*—
Kamada, Kazumasa; Tamai, Katsumi; Abe, Kazunori; and Shiraishi, Yoshinobu, 4,525,537, Cl. 525-198.000.

Abe, Michiharu, to Ricoh Company, Ltd. Focussing control with astigmatic diffracting means. 4,525,625, Cl. 250-201.000.

Abe, Shozo, to NGK Insulators, Ltd. Ceramic leadless packages and a process for manufacturing the same. 4,525,597, Cl. 174-52.0FP.

Abe, Yumiko; and Yasuda, Kenji, to Hitachi, Ltd. Electrochemical sensor capable of determining hydrogen peroxide concentration and analyzer using the same. 4,525,265, Cl. 204-403.000.

Abels, Martin: *See*—
Woditsch, Peter; Abels, Martin; and Brazel, Berthold, 4,525,334, Cl. 423-324.000.

Abendstein, Karl: *See*—
Pochmarski, Luzian; Koller, Otto; and Abendstein, Karl, 4,525,211, Cl. 75-58.000.

Abrams, William C. Apparatus for applying a coating material. 4,524,715, Cl. 118-221.000.

Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, to Bristol-Myers Company. Cephalosporins. 4,525,473, Cl. 514-202.000.

Adam, Jean-Marie, to Ciba-Geigy Corporation. Quaternary ammonium substituted benzothiazolylphenyl azo pyrimidine dyes. 4,525,583, Cl. 534-606.000.

Adams, John Q., IV. Bee shipping box and hive. 4,524,476, Cl. 6-1.000.

Adams, Richard M. Orthodontic device to serve as removable anchorage for elastic traction between upper and lower molars. 4,525,143, Cl. 433-5.000.

Adams, William D. Fuel system for combustion engine. 4,524,744, Cl. 123-459.000.

Adaway, Timothy J.; Fravel, Harold G., Jr.; and Easterly, James P., Jr., to Dow Chemical Company, The. Self-inverting water-in-oil emulsions of water-soluble polymers. 4,525,496, Cl. 523-337.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,525,506, Cl. 524-102.000.

Adler, Alan D.: *See*—
Casey, Adria C.; Adler, Alan D.; and Premuzic, Eugene T., 4,525,350, Cl. 424-94.000.

Admiraal, Daniel J. H.; and Lopes Cardozo, Benjamin, to U.S. Philips Corporation. Amplifier arrangement for acoustic signals, provided with means for suppressing (undersired) spurious signals. 4,525,856, Cl. 381-93.000.

Adver-Togs, Inc.: *See*—
Lister, Jerry D., 4,525,295, Cl. 252-301.360.

Aetna Telecommunications Laboratories: *See*—
Elion, Glenn R., 4,525,026, Cl. 350-96.230.

Affolter, Peter, to Eastman Kodak Company. Optical disk assembly retaining rings. 4,525,829, Cl. 369-284.000.

Agency of Industrial Science & Technology: *See*—
Ebata, Yoshihiro; Tamari, Nobuyuki; Toibana, Yasuo; and Hayami, Ryozo, 4,525,387, Cl. 427-190.000.
Yamanaka, Kazushi, 4,524,621, Cl. 73-597.000.

Agfa-Gevaert N.V.: *See*—
De Roo, Pierre R.; and Tavernier, Serge M., 4,525,445, Cl. 430-109.000.
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., 4,525,446, Cl. 430-117.000.

Agnello, Joseph A., Jr.: *See*—
Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,524,534, Cl. 42-1.00S.

Agriculture Service Corporation: *See*—
Warkentin, Henry, 4,524,780, Cl. 130-30.00G.

Agro Land & Cattle Company, Inc.: *See*—
Bates, Robert L., 4,524,535, Cl. 43-4.500.

Agulnek, Martin A.; Canter, Joseph M.; and Reisch, Michael L., to Polaroid Corporation. Parallel LED exposure control system. 4,525,729, Cl. 346-154.000.

Ahlgren, Frederic F., to General Electric Company. Capacitively ballasted low voltage incandescent lamp. 4,525,651, Cl. 315-240.000.

Ahnemiller, James; and Peascoe, Warren J., to Uniroyal, Inc. Method for making polyester resin foam by spraying. 4,525,487, Cl. 521-78.000.

Aihara, Kenji: *See*—
Tsukamoto, Takashi; Sudo, Chuzo; Aihara, Kenji; and Nishimura, Syozi, 4,525,598, Cl. 174-128.00R.

Aihara, Yoshihiko: *See*—
Someya, Hiromi; Aihara, Yoshihiko; Mizogui, Toyokazu; and Suzuki, Nobuyuki, 4,525,054, Cl. 354-443.000.

Aioi Seiki Kabushiki Kaisha: *See*—
Yonezawa, Keitaro, 4,524,660, Cl. 83-639.000.

Air Cabin Engineering: *See*—
Seitz, Fred H.; and Jaschke, Max J., 4,524,976, Cl. 273-388.000.

Air Products and Chemicals, Inc.: *See*—
Burke, Thomas W.; and Klee, David J., 4,524,550, Cl. 51-424.000.
Galla, Edward A.; and Smoyer, Bruce A., 4,525,316, Cl. 264-54.000.
Klee, David J.; and Ehnot, Donald J., 4,524,548, Cl. 51-322.000.
Newton, Charles L., 4,525,185, Cl. 62-11.000.
Woodward, Donald W.; Katsaros, Arthur T.; and Rowles, Howard C., 4,525,187, Cl. 62-31.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Miyagawa, Seiichi; and Nakane, Takeshi, 4,525,670, Cl. 324-208.000.

Aizawa, Kohki: *See*—
Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, 4,525,636, Cl. 307-264.000.

Aizawa, Kuniomi: *See*—
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, 4,525,712, Cl. 340-825.310.

Akahane, Shoji: *See*—
Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, 4,524,824, Cl. 106-35.000.

Akamatsu, Junichi: *See*—
Nakane, Yasuaki; Akamatsu, Junichi; Sakamoto, Susumu; and Kiyomiya, Tadashi, 4,525,412, Cl. 428-199.000.

Akamatsu, Osamu; and Kitaue, Masaaki, to Nippon Air Brake Co., Ltd. Fluid pressure switch. 4,525,611, Cl. 200-83.00R.

Akazawa, Hiroyuki, to Epson Corporation. Serial printer. 4,525,085, Cl. 400-59.000.

Akiyama, Chuji: *See*—
Yamasaki, Hiro; Chin, Tung Jin; and Akiyama, Chuji, 4,524,627, Cl. 73-861.120.

Aktiebolaget Draco: *See*—
Wetterlin, Kjell I. L., 4,524,769, Cl. 128-203.150.

Aktiebolaget Svenskt Mjolsocker: *See*—
Ostlund, Gunnar, 4,525,275, Cl. 210-323.200.

Aktiengesellschaft M.A.N. Maschinenfabrik Augsburg-Nurnberg: *See*—
Stemmler, Bruno; and Zeilinger, Hans, 4,525,389, Cl. 427-255.100.

Akzo NV: *See*—
Lange, Wolfgang; and Boer, G. J., 4,525,340, Cl. 424-16.000.

Alberghini, Alfred C.: *See*—
Nickel, Gerhard E. B.; and Alberghini, Alfred C., 4,525,377, Cl. 427-12.000.

Alcan Aluminum Corporation: *See*—
Hauser, Henry W., Jr., 4,525,131, Cl. 425-114.000.

Alcon Laboratories, Inc.: *See*—
Stark, Raymond L., 4,525,346, Cl. 424-80.000.

Alden, John W., Jr.: *See*—
Hill, Frank P., Jr.; Alden, John W., Jr.; and Williams, Harry K., 4,524,729, Cl. 122-498.000.

Alexander, Gabriel G.: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,524,832, Cl. 166-347.000.

Alexander, John H., to Standard Telephones and Cables plc. Ceramic capacitor and dielectric compositions. 4,525,767, Cl. 361-321.000.

Alfa-Laval Marine and Powering Engineering AB: *See*—
Nilsson, Vilgot, deceased, 4,525,155, Cl. 494-3.000.

Allegheny Ludlum Steel Corporation: *See*—
Deverell, Harry E.; and Beigay, Jack M., 4,525,620, Cl. 219-137.0WM.
Hunt, Joseph M., 4,524,996, Cl. 285-55.000.

Allied Corporation: *See*—
Campbell, Donald N.; and Schmidt, John C., 4,525,704, Cl. 340-632.000.

Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,525,643, Cl. 310-313.00A.
Hochberg, Arie; Haylock, John C.; and Mason, Charles D., 4,525,513, Cl. 524-288.000.
Schildkraut, Alan L.; and Brush, Robert W., Sr., 4,525,017, Cl. 339-89.00M.
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,525,266, Cl. 204-412.000.

Allied Products Corporation: *See*—
Harden, Jerrell W., 4,524,837, Cl. 172-156.000.

Allis-Chalmers Corp.: *See*—
Haupt, Robert C., 4,524,634, Cl. 74-473.00R.

Allison, George E. Method for preparing an expanded food product. 4,525,367, Cl. 426-394.000.

Allison, John H. Pressure energy storage device. 4,525,631, Cl. 290-4.00R.

Allred, Lorin D.: *See*—
Wever, Ruben; Allred, Lorin D.; and Ruiz, Marco A., 4,525,605, Cl. 179-175.20R.

Almond, Stephen W.: *See*—
Hanlon, David J.; and Almond, Stephen W., 4,524,829, Cl. 166-294.000.

Alpaugh, Warren A.; Amelio, William J.; Markovich, Voya; and Sambucetti, Carlos J., to International Business Machines Corporation. Deposition of copper from electroless plating compositions. 4,525,390, Cl. 427-305.000.

Alpha Corporation, The: *See*—
Bayha, Charles E.; and McQueen, Daniel H., 4,525,427, Cl. 428-458.000.

Altensu, Ernst-Wilhelm; Hahn, Ulf; and Sabranski, Udo, to Rheinmetall GmbH. Explosive shrapnel shell. 4,524,696, Cl. 102-491.000.

Altounian, George N., to Centre de Recherche Industrielle de Quebec. Polyesters polyols prepared from glutaric acid, succinic acid and adipic acid, and polyurethanes prepared therefrom. 4,525,574, Cl. 528-283.000.

ALZA Corporation: *See*—
Urquhart, John; and Theeuwes, Felix, 4,525,162, Cl. 604-56.000.

Amana Refrigeration, Inc.: *See*—
Bond, Ralph W., 4,524,588, Cl. 62-262.000.
Wyland, Alvin D., 4,525,615, Cl. 219-10.55M.

Amato, Joseph S.; Karady, Sandor; and Weinstock, Leonard M., to Merck & Co., Inc. Silyl, benzyl, p-nitrobenyl, or methyl esters of diazoacetate, a synthon used in the conversion of penicillin to thienamycin. 4,525,582, Cl. 534-558.000.

Amelio, William J.: *See*—
Alpaugh, Warren A.; Amelio, William J.; Markovich, Voya; and Sambucetti, Carlos J., 4,525,390, Cl. 427-305.000.

American Can Company: *See*—
McHenry, Robert J.; and Ryan, Martin A., 4,525,134, Cl. 425-130.000.

American Cast Iron Pipe Company: *See*—
Conner, Randall C., 4,524,505, Cl. 29-453.000.

American Colloid Company: *See*—
Takeda, Hisao; and Taniguchi, Yasunori, 4,525,527, Cl. 524-831.000.

American Cyanamid Company: *See*—
Chang, Eugene Y. C., 4,525,568, Cl. 528-60.000.
Kimpara, Masaomi; and Suzuki, Munehiro, 4,525,200, Cl. 71-76.000.

American Hoechst Corporation: *See*—
Posey, Robert G.; and Culbertson, Edwin C., 4,525,419, Cl. 428-336.000.

American Pecco Corporation: *See*—
ten Broeke, Klaas E.; and Kohler, Manfred R., 4,524,874, Cl. 212-197.000.

American Screen Printing Equipment Company: *See*—
Bubley, Henry J., 4,524,687, Cl. 101-123.000.

American Standard Inc.: *See*—
Bodziak, Thomas A., 4,524,932, Cl. 246-247.000.
Rogers, Larry K., 4,524,676, Cl. 91-43.000.
Wilson, Richard L., 4,525,011, Cl. 303-19.000.

American Thermometer Co., Inc.: *See*—
Brown, George T., Jr.; and Blakely, Lewis E., Jr., 4,524,778, Cl. 128-736.000.
Brown, George T., Jr., 4,524,779, Cl. 128-736.000.

Ammann, Heinz, to Sulzer Brothers Limited. Heat exchanger. 4,524,727, Cl. 122-235.00A.

AMP Incorporated: *See*—
Lawson, Gustaf R., 4,525,023, Cl. 339-258.00R.

Ampat/Midwest Corp.: *See*—
Mauser, Richard J., 4,524,978, Cl. 277-189.000.

Ampex Corporation: *See*—
Handley, Kirk H., 4,525,754, Cl. 360-51.000.

Anchor Wire Corporation: *See*—
Hogg, James W., 4,524,939, Cl. 248-467.000.

Anderson, Orin M.: *See*—
Hall, Charles W.; and Anderson, Orin M., 4,524,466, Cl. 603-3.000.

Anderson, William T. Flowable concrete delivery handling apparatus. 4,524,994, Cl. 285-38.000.

Andle, Jeffrey C.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,525,643, Cl. 310-313.00A.

Ando, Fumihiko: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, 4,525,742, Cl. 358-213.000.

Ando, Takayuki: *See*—
Sawano, Susumu; Gofuku, Yoshihiro; Hashimoto, Junji; and Ando, Takayuki, 4,524,851, Cl. 188-134.000.

Andreas Stihl: *See*—
Mierzwa, Dietmar, 4,524,881, Cl. 220-374.000.

Andrews, Joseph E., Jr.: *See*—
Richmond, Carl T.; Butler, Thomas A.; and Andrews, Joseph E., Jr., 4,525,675, Cl. 328-140.000.

Andrews, Stanley W., to Precision Grinding Limited. Arrangement for use in positioning an optical image. 4,525,041, Cl. 350-484.000.

Andy, Robert. High strength flame resistant poly-olefins comprising surface coated alumina hydrate plus organic titanate and methods of making the same. 4,525,494, Cl. 523-200.000.

Anicon, Inc.: *See*—
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,524,719, Cl. 118-719.000.

Anthony, Blair T., to General Electric Company. Ultraviolet light absorbing agents, method for making, compositions, and articles containing same. 4,525,426, Cl. 428-447.000.

Anzai, Mitsuru: *See*—
Ohya, Masaki; Matsukura, Yoshihiro; and Anzai, Mitsuru, 4,525,414, Cl. 428-213.000.

Aoki, Akihiro; Hiratsuka, Shozaburo; Yamaguchi, Norihisa; and Makino, Shoji, to Teijin Limited. Process for producing wholly aromatic polyamide filaments heat-treated under tension. 4,525,384, Cl. 427-174.000.

Aoki, Yuji: *See*—
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,525,536, Cl. 525-194.000.

Apostola, Samuel N.: *See*—
Mallalieu, David H.; Apostola, Samuel N.; and DeVries, Douglas C., 4,524,514, Cl. 30-169.000.

Apple Computer, Inc.: *See*—
Butts, Gary C., 4,525,613, Cl. 200-159.00R.

Appleton Papers Inc.: *See*—
Mueller, Hans J., 4,524,716, Cl. 118-665.000.

Arai, Kenichi: *See*—
Tsuya, Noboru; and Arai, Kenichi, 4,525,223, Cl. 148-171.000.

Arai, Tetsuji; and Mimura, Yoshiki, to Ushio Denki Kabushiki Kaisha. Heating method of semiconductor wafer. 4,525,380, Cl. 427-53.100.

Arata, Ryozo: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,525,506, Cl. 524-102.000.

Arbed S.A.: *See*—
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.

Argentino, Giovanni: *See*—
Serrao, Charles A., 4,524,768, Cl. 128-134.000.

Aristoff, Paul A., to Upjohn Company, The. Composition and process. 4,525,586, Cl. 544-174.000.

Arizono, Kenzo; Terasawa, Michio; and Nobutoki, Michiharu, to Yoshitomi Pharmaceutical Industries, Ltd. Pranoprofen gelled ointment. 4,525,348, Cl. 424-81.000.

Armerad Betong Vagforbattringar Aktiebolag: *See*—
Eriksson, Sture, 4,525,172, Cl. 44-32.000.

Armstrong, Bruce A.: *See*—
McMahon, Garfield W.; and Armstrong, Bruce A., 4,524,693, Cl. 367-167.000.

Armstrong World Industries, Inc.: *See*—
Phan, Xuan T.; and Shannon, Paul J., 4,525,302, Cl. 260-239.30R.

Arnold, Dieter, to Carl Schenck AG. Method and apparatus for controlling the density distribution of bulk material. 4,524,810, Cl. 141-250.000.

Aronson, Vita: *See*—
Valayil, Silvester P.; and Aronson, Vita, 4,525,759, Cl. 360-135.000.

Arora, Mulk R., to North American Philips Corporation. Two step electro chemical and chemical etch process for high volt aluminum anode foil. 4,525,249, Cl. 204-129.750.

Artz, Glen D.; and Flanagan, Joseph E., to Rockwell International Corporation. High yield nitrogen gas generators. 4,525,226, Cl. 149-35.000.

Asahara, Yoshiyuki: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,525,189, Cl. 65-3.150.

Asahi Glass Company, Ltd.: *See*—
Narisawa, Shigeyuki; Funaki, Masahiko; Kojima, Hiroaki; and Kuga, Kazuhiko, 4,525,491, Cl. 521-174.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Fukawa, Isaburo; and Sato, Kazutoshi, 4,525,546, Cl. 526-68.000.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,525,589, Cl. 544-128.000.
Takasa, Kenji; and Nakamura, Masakatsu, 4,525,396, Cl. 428-35.000.
Yamataka, Kazunori; and Isoya, Toshiro, 4,525,251, Cl. 204-79.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Takaoka, Yukio; Morizumi, Masaaki; and Takahashi, Norimichi, 4,525,046, Cl. 354-149.110.

Asakawa, Teruo: *See*—
Imahashi, Issei; and Asakawa, Teruo, 4,525,659, Cl. 318-649.000.

Asama Chemical Co., Ltd.: *See*—
Yajima, Mizuo, 4,525,306, Cl. 260-428.500.

Ashland Oil, Inc.: *See*—
Barger, Dwight F., 4,525,268, Cl. 208-73.000.

Ashman, Glynn; Winterbottom, Martin E.; and Berry, Kelvin T., to Lucas Industries Limited. Seals used in piston and cylinder arrangements. 4,524,677, Cl. 92-168.000.
Ashrow, David P. Swimming harness. 4,524,711, Cl. 114-215.000.
Association pour la Recherche et le Developpement des Methodes et Processus Industriels (ARMINES): *See*—
Richon, Dominique; and Renon, Henri, 4,524,611, Cl. 73-59.000.
AT&T Bell Laboratories: *See*—
Baker, Gregory L.; and Bates, Frank S., 4,525,538, Cl. 525-275.000.
Boivie, Richard H., 4,525,860, Cl. 382-21.000.
Carlin, James W., 4,525,716, Cl. 343-381.000.
Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., 4,525,687, Cl. 332-7.510.
Kemper, Kyran B.; and Rubin, Harvey, 4,525,789, Cl. 364-481.000.
Rubin, Harvey, 4,525,795, Cl. 364-721.000.
AT&T Technologies, Inc.: *See*—
Wiechard, Charles A., 4,524,516, Cl. 30-290.000.
AT&T Teletype Corporation: *See*—
Cardona, Ramon M.; Leno, Theodore M.; and O'Leary, Melody M., 4,525,087, Cl. 400-613.200.
Atkins, Kenneth E.; and Gentry, Robert R ., to Union Carbide Corporation. Polyester fiber reinforced molding compounds. 4,525,498, Cl. 523-511.000.
Atlas Copco Aktiebolag: *See*—
Van Hee, Michel A. J., 4,524,638, Cl. 74-606.00R.
Atlas Powder Company: *See*—
Cechanski, Michael, 4,525,225, Cl. 149-19.500.
Atobe, Masaaki; and Tagashira, Yoshimi, to Nippon Electric Co., Ltd. PSK Demodulation system having carrier frequency variation compensation. 4,525,676, Cl. 329-50.000.
Auburn Research Foundation: *See*—
Harris, Hubert; and Smith, Durward A., 4,524,681, Cl. 99-474.000.
Aucouturier, Jean L.: *See*—
Vidalin, Jacques; and Aucouturier, Jean L., 4,525,803, Cl. 364-900.000.
Audi AG: *See*—
Bauder, Armin, 4,524,735, Cl. 123-196.00R.
Audi NsU Auto Union AG.: *See*—
Brockhaus, Herbert, 4,524,740, Cl. 123-340.000.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Bauder, Armin, 4,524,979, Cl. 277-189.000.
Automobiles Peugeot/Automobiles Citroen: *See*—
Hulin, Rene ; and Schuler, Daniel, 4,524,635, Cl. 74-476.000.
Aviram, Ari: *See*—
Sachdev, Krishna G.; Sachdev, Harbans S.; Aviram, Ari; and Wizner, Mark A., 4,525,722, Cl. 346-1.100.
Axelson, Peter W. Controllable sled for snow skiing. 4,524,984, Cl. 280-18.000.
Ayers, Ray R.: *See*—
Stevens, James W.; and Ayers, Ray R., 4,525,101, Cl. 405-169.000.
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., to United States of America, Energy. Sliding-gate valve for use with abrasive materials. 4,524,796, Cl. 137-240.000.
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, to Hoogovens Groep B.V.; and Foseco Trading A.G. Method of operating a mixer type hot metal car for the transport of molten iron and a device for carrying out the method. 4,524,954, Cl. 266-45.000.
Baba, Keikichi: *See*—
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,525,558, Cl. 526-142.000.
Bacardit, Joan S.: *See*—
Coll, Juan V.; Bacardit, Joan S.; and Bofill, Joaquim F., 4,524,585, Cl. 60-562.000.
Bachle, Walter W., to General Signal Corporation. Cable fitting with variable inner diameter grommet assembly. 4,525,000, Cl. 285-177.000.
Bachmann, Alfred. Tongs for inserting a curtain-carrying sliding member into a profiled curtain rail. 4,524,502, Cl. 29-268.000.
Bachmann, Herbert, to Stopinc Aktiengesellschaft. Linear sliding closure unit. 4,524,956, Cl. 266-236.000.
Bachmann, Rainer, to Black & Decker Inc. Electrically driven tacker or the like for driving fastening elements into a workpiece. 4,524,897, Cl. 227-131.000.
Bagdal, Karl T.: *See*—
Hoover, Bradley R.; and Bagdal, Karl T., 4,524,546, Cl. 51-165.00R.
Bagdasarov, Khachik S.: *See*—
Petrosian, Ashot G.; Bagdasarov, Khachik S.; Kuzanian, Armen S.; Ovanesian, Karine L.; and Butaeva, Tatyana I., 4,525,460, Cl. 501-86.000.
Bagus, Brian M.: *See*—
Bione, Angelo A.; and Bagus, Brian M., 4,524,665, Cl. 84-1.010.
Bailey, Dana S.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,525,643, Cl. 310-313.00A.
Bailey, Frank C.: *See*—
Law, Kock-Yee; and Bailey, Frank C., 4,525,592, Cl. 564-307.000.
Bailey, Gregory W. Rotary compression bending machine. 4,524,599, Cl. 72-321.000.
Bainton, Stephen D.: *See*—
Vance, Ian A. W.; and Bainton, Stephen D., 4,525,835, Cl. 370-29.000.
Baker, Gregory L.; and Bates, Frank S., to AT&T Bell Laboratories. Polymerizing monomer in presence of polymer containing electrophilic moiety using Ziegler-Natta catalyst. 4,525,538, Cl. 525-275.000.
Baker, Melvin C., to Du Pont de Nemours, E. I., and Company. Method for reducing color of poly(tetramethylene ether) glycol with hypochlorite. 4,525,580, Cl. 528-490.000.
Baker, Peter J.; Brookes, David A.; and Johnson, Martin, to British Petroleum Company p.l.c., The. Mineral slurries. 4,525,173, Cl. 44-51.000.
Bakish Materials Corp.: *See*—
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, 4,524,717, Cl. 118-718.000.
Ball, Donald L.: *See*—
Boateng, Daniel A. D.; Ball, Donald L.; and Swinkels, Godefridus M., 4,525,332, Cl. 423-89.000.
Ball, John M.: *See*—
McMahan, William J.; and Ball, John M., 4,524,606, Cl. 73-40.000.
Ball, Lawrence E.: *See*—
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,525,578, Cl. 528-354.000.
Ball, Wolfgang: *See*—
Warzelhan, Volker; and Ball, Wolfgang, 4,525,550, Cl. 526-116.000.
Ballard, Louis F., to MTD Products Inc. Selecting mechanism. 4,524,632, Cl. 74-471.00R.
Balliello, Paolo, to Ciba-Geigy Corporation. Solid formulations of metal complex dyes. 4,525,170, Cl. 8-524.000.
Balsavage, Walter. Magazine and feed mechanism for firearms. 4,524,672, Cl. 89-33.100.
Baltes, Eugene ; de Lannoy, Jean; and Rodriguez, Ludovic, to UCB Pharmaceuticals, Inc. 2-[4-(Diphenylmethyl)-1-piperazinyl]-acetic acids and their amides. 4,525,358, Cl. 514-255.000.
BAMA, SpA: *See*—
Verdi, Guido, 4,525,236, Cl. 156-517.000.
Bangerter, Roger O.; and Meeker, Donald J., to United States of America, Energy. Ion beam inertial confinement target. 4,525,323, Cl. 376-106.000.
Bantjes, John H.: *See*—
Patil, Arvind S.; Bantjes, John H.; Pepoy, Louis J.; and Sappok, Reinhard J., 4,525,217, Cl. 106-304.000.
Barbet, Karl-Heinz: *See*—
Busch, Peter; and Barbet, Karl-Heinz, 4,524,943, Cl. 249-63.000.
Bardin, Roland; Mack, Joel; and Counioux, Jean-Jacques, to Compagnie Europeenne d'Accumulateurs. Lead-antimony-magnesium alloys for storage cell supports and method of manufacturing said alloys. 4,525,327, Cl. 420-565.000.
Barer, Sol J.; and Terwedow, Henry A., Jr. Mosquito development inhibitor employing substituted phenols. 4,525,362, Cl. 514-712.000.
Barger, Dwight F., to Ashland Oil, Inc. Combination process for upgrading residual oils. 4,525,268, Cl. 208-73.000.
Barletta, Joseph M.; and Yang, John P., to Lockheed Electronics Co., Inc. Electronic tag identification system. 4,525,713, Cl. 340-825.540.
Barnes, Johnny G.; Hooten, John A.; Hurley, Patrick J.; and Miller, Ernest L., to International Business Machines Corporation. Printer sharing by plurality of display units in word processing system. 4,525,806, Cl. 364-900.000.
Barnes, Pierre D.; and Marts, Maynard W., to Cessna Aircraft Company, The. Proportional solenoid valve. 4,524,947, Cl. 251-129.000.
Barnette, Luverne H.; and Liang, Charles C., to Duracell Inc. Solid state cell with anolyte. 4,525,440, Cl. 429-191.000.
Barnich, Richard G.; Ferguson, Michael H.; and McGregor, Charles K. Telephone call accounting system. 4,525,601, Cl. 179-7.0MM.
Barron, Charles D.; and Kuus, Felix, to Smith International, Inc. Cablehead side entry sub. 4,524,834, Cl. 166-385.000.
Bartholomew, Donald D., to Proprietary Technology, Inc. Swivelable quick connector assembly. 4,524,995, Cl. 285-54.000.
Bartnick, Bernhard: *See*—
Hofer, Rainer; and Bartnick, Bernhard, 4,525,525, Cl. 524-742.000.
Bartsch, Erich O.; and Vollstedt, Gerald, to Deutsche Texaco Aktiengesellschaft. Method of loading and/or transferring environmentally harmful materials in shallow-water and mudland regions and artificial islands suitable therefor. 4,525,282, Cl. 210-747.000.
Bascou, Jacques, to Regie Nationale des Usines Renault. Retractable key carrier. 4,524,594, Cl. 70-456.00R.
BASF Aktiengesellschaft: *See*—
Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, 4,525,570, Cl. 528-75.000.
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Raubenheimer, Hans-Jurgen, 4,525,581, Cl. 528-503.000.
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,525,484, Cl. 521-56.000.
Lotsch, Wolfgang; Kemper, Reinhard; and Schefczik, Ernst, 4,525,591, Cl. 544-250.000.
Warzelhan, Volker; and Ball, Wolfgang, 4,525,550, Cl. 526-116.000.
BASF Wyandotte Corporation: *See*—
Narayan, Thirumurti, 4,525,489, Cl. 521-108.000.
Patil, Arvind S.; Bantjes, John H.; Pepoy, Louis J.; and Sappok, Reinhard J., 4,525,217, Cl. 106-304.000.
Basinger, Richard A.: *See*—
Hemmerle, Clayton J.; and Basinger, Richard A., 4,524,504, Cl. 29-450.000.
Bates, Frank S.: *See*—
Baker, Gregory L.; and Bates, Frank S., 4,525,538, Cl. 525-275.000.
Bates, Robert L., to Agro Land & Cattle Company, Inc. Trolling method and apparatus. 4,524,535, Cl. 43-4.500.
Battelle Memorial Institute: *See*—
Giddey, Claude; and Dove, Georges, 4,525,372, Cl. 426-564.000.

Bauder, Armin, to Audi AG. Reciprocating piston engine. 4,524,735, Cl. 123-196.00R.

Bauder, Armin, to Audi NSU Auto Union Aktiengesellschaft. Cylinder head gasket for internal combustion engines. 4,524,979, Cl. 277-189.000.

Baues, Peter, to Siemens Aktiengesellschaft. Device for transmitting measured values to a remote location. 4,525,873, Cl. 455-600.000.

Baues, Peter, to Siemens Aktiengesellschaft. Device for transmitting measured values to a remote location. 4,525,874, Cl. 455-600.000.

Bauman, Robert C. Soft contact lens with surface identification and method of using same. 4,525,044, Cl. 351-160.00H.

Baur, Walter: *See*—
Hauers, Manfred; and Baur, Walter, 4,524,566, Cl. 53-534.000.

Bay, David L.: *See*—
Knoll, William C.; and Bay, David L., 4,525,649, Cl. 315-96.000.

Bayer Aktiengesellschaft: *See*—
Bonten, Heinz; Nielinger, Werner; Michael, Dietrich; and Haupt, Heinrich, 4,525,505, Cl. 524-100.000.
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, 4,525,561, Cl. 526-220.000.
Holmwood, Graham; and Lurssen, Klaus, 4,525,204, Cl. 71-92.000.
Horak, Otto; Falkenberg, Werner; Muders, Rolf; and Beinert, Werner, 4,525,283, Cl. 210-762.000.
Hynek, Bernd; Valk, Giselher; and Treptau, Gerhard, 4,525,403, Cl. 428-87.000.
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; and Heitz, Walter, 4,525,579, Cl. 528-388.000.
Rasshofer, Werner, 4,525,534, Cl. 525-127.000.
Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, 4,525,590, Cl. 544-222.000.
Woditsch, Peter; Abels, Martin; and Brazel, Berthold, 4,525,334, Cl. 423-324.000.

Bayerische Motoren Werke AG: *See*—
Huber, Siegfried, 4,524,465, Cl. 2-424.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Bourauel, Fritz; Flohr, Wolfgang P.; and Weishaupt, Walter, 4,524,612, Cl. 73-117.300.

Bayha, Charles E.; and McQueen, Daniel H., to Alpha Corporation, The. Polyester primer composition and method. 4,525,427, Cl. 428-458.000.

Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Distributed IMPATT structure. 4,525,732, Cl. 357-13.000.

Bazell, Seymour: *See*—
Goldberg, Edward M.; and Bazell, Seymour, 4,525,167, Cl. 604-135.000.

BBC Brown, Boveri & Cie: *See*—
Vlasak, Thomas, 4,525,224, Cl. 148-189.000.

BBC Brown, Boveri & Company, Limited: *See*—
Brugger, Manfred; Janczer, Peter; and Peter, Hans, 4,524,817, Cl. 164-290.000.

Beckwith, Robert S.: *See*—
Bellefeuille, David T.; and Beckwith, Robert S., 4,524,608, Cl. 73-40.50R.

Beecham Group p.l.c.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,352, Cl. 424-114.000.
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,353, Cl. 424-114.000.

Beha, Johannes G.; Jaeckel, Heinz; and Vettiger, Peter, to International Business Machines Corporation. Buried junction Josephson interferometer. 4,525,730, Cl. 357-5.000.

Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, to Hoffmann-La Roche Inc. Enteric coated oral dosage form. 4,525,339, Cl. 424-16.000.

Behr, Werner, to Deutsche Spezialglas AG. Dark blue dyed furnace sight glass with high infrared absorption. 4,525,462, Cl. 501-71.000.

Beigay, Jack M.: *See*—
Deverell, Harry E.; and Beigay, Jack M., 4,525,620, Cl. 219-137.0WM.

Beinert, Werner: *See*—
Horak, Otto; Falkenberg, Werner; Muders, Rolf; and Beinert, Werner, 4,525,283, Cl. 210-762.000.

Bek-Tech Products Incorporated: *See*—
Trammell, Earl M., Jr., 4,525,664, Cl. 324-51.000.

Belden, Byron B.: *See*—
Johnson, James D.; Belden, Byron B.; and Kamp, Terrence A., 4,525,094, Cl. 403-11.000.

Bell, James D., to Union Underwear Company, Inc. Trim attaching machine and method. 4,524,706, Cl. 112-121.290.

Bell Telephone Laboratories, Incorporated: *See*—
Eldumiati, Ismail I.; and Maul, Michael K., 4,525,776, Cl. 364-200.000.

Bellefeuille, David T.; and Beckwith, Robert S. Gas leak meter. 4,524,608, Cl. 73-40.50R.

Bellino, Joseph P., to General Electric Company. Portable smoke alarm. 4,525,703, Cl. 340-628.000.

Belly, Robert T.: *See*—
Guardino, Robert F.; and Belly, Robert T., 4,525,453, Cl. 435-34.000.

Bender, Rolf; Jacob, Werner; and Pfuderer, Horst, to INA Walzlager Schaeffler KG. Antifriction bearing for longitudinal displacement guidance of a gun barrel. 4,524,671, Cl. 89-14.050.

Bendiberica /S.A.: *See*—
Coll, Juan V.; Bacardit, Joan S.; and Bofill, Joaquim F., 4,524,585, Cl. 60-562.000.

Beneteau, Donald J. Resistance welding apparatus. 4,525,618, Cl. 219-89.000.

Bengtsson, Bengt L.; Palmlin, Peter; and Ekholm, Jan, to Nestec S.A. Blanching of mushrooms. 4,525,368, Cl. 426-438.000.

Benusa, John E.; and Kingston, Richard L. Method for stomach lavage. 4,525,156, Cl. 604-28.000.

Berg, Lloyd; and Yeh, An-I. Separation of n-butyl acetate from n-butanol by extractive distillation. 4,525,245, Cl. 203-51.000.

Berges, Hanns-Peter; Frieden, Peter; and Leier, Wolfgang, to Leybold-Heraeus GmbH. Oil-sealed vacuum pump. 4,525,129, Cl. 418-84.000.

Bergmann, Conrad E. Apparatus for packaging articles. 4,525,133, Cl. 425-120.000.

Bergmann, Heinz. Equipment for compacting trash consisting of packing materials and easily compressed wastes. 4,524,685, Cl. 100-210.000.

Bergwerksverband GmbH: *See*—
Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans, 4,525,103, Cl. 405-261.000.
Stephan, Peter, 4,525,104, Cl. 405-290.000.

Berke, Philip A.; and Rosen, William E., to Sutton Laboratories, Inc. Composition of matter containing cinnamaldehyde and parabens. 4,525,480, Cl. 514-544.000.

Berkowitz, Edward H., to Varian Associates, Inc. NMR spectrometer incorporating a re-entrant FIFO. 4,525,673, Cl. 324-312.000.

Bernardi, Carl E. Automatic apparatus for downsetting lead frame strips. 4,524,601, Cl. 72-422.000.

Berry, Kelvin T.: *See*—
Ashman, Glynn; Winterbottom, Martin E.; and Berry, Kelvin T., 4,524,677, Cl. 92-168.000.

Berry, Milton E.; and Shibata, Mitsuyoshi, to Southwire Company. Apparatus to improve casting band life. 4,524,821, Cl. 164-482.000.

Bertrand, Jean-Noel; and Castelein, Jean, to Montefina, S.A. Polymer compositions. 4,525,533, Cl. 525-98.000.

Bertsch, Ludo A.: *See*—
Dodds, David E.; and Bertsch, Ludo A., 4,525,845, Cl. 375-36.000.

Beskid, George: *See*—
Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, 4,525,339, Cl. 424-16.000.

Beth Israel Hospital Association, The: *See*—
Lanner, Michael; and Coffey, Cynthia L., 4,524,721, Cl. 119-17.000.

Bethmann, Karl W.: *See*—
Bocker, Jurgen; Gersbach, Klaus; Bethmann, Karl W.; and Glotz, Gerhard, 4,524,697, Cl. 102-517.000.

Betts, William L.: *See*—
Bremer, Gordon; Betts, William L.; and Greene, Robert T., 4,525,846, Cl. 375-39.000.

Billard, Alain A.; Santalucia, Andre R.; and Breseghello, Christian, to Societe E. Lacroix-Tous Artifices. Securing apparatus for modules carried on aircraft, in particular for flare launching modules. 4,524,670, Cl. 89-1.530.

Bilofsky, Ruth C.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,525,413, Cl. 428-212.000.

Bindl, Max. Utility water boiler. 4,524,726, Cl. 122-13.00R.

Bio-Chem Valve Corp.: *See*—
Lawrence, John N.; and Sandor, Istvan, 4,524,802, Cl. 137-595.000.

Bione, Angelo A.; and Bagus, Brian M., to Marmon Group, Inc., The. Dynamic controller for sampling channels in an electronic organ having multiplexed keying. 4,524,665, Cl. 84-1.010.

Biotek, Inc.: *See*—
Loeb, Marvin P.; and Olson, Arne M., 4,525,164, Cl. 604-131.000.

Birch, Robert G.; and Patil, Suresh S., to University of Hawaii. Antibiotic and process for the production thereof. 4,525,354, Cl. 424-115.000.

Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., to Etat Francais. Finned subcaliber projectile. 4,524,695, Cl. 102-430.000.

Black & Decker Inc.: *See*—
Bachmann, Rainer, 4,524,897, Cl. 227-131.000.

Blackman, Peter: *See*—
Davids, Martin; Blackman, Peter; and Teo, Lily, 4,525,779, Cl. 364-200.000.

Blaimschein, Gottfried; and Marzy, Otto, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H. Milling machine. 4,525,112, Cl. 409-199.000.

Blair, Richard F.: *See*—
Drexel, Charles F.; and Blair, Richard F., 4,524,616, Cl. 73-203.000.

Blakely, Lewis E., Jr.: *See*—
Brown, George T., Jr.; and Blakely, Lewis E., Jr., 4,524,778, Cl. 128-736.000.

Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., to Fuchs Systems, Inc. Burner in a drum. 4,525,139, Cl. 431-189.000.

Blemlek, William A., to Thomas J. Lipton, Inc. Lecithinated noodles and process for manufacture thereof. 4,525,371, Cl. 426-557.000.

Blendax-Werke R. Schneider GmbH & Co.: *See*—
Raaf, Helmut, 4,525,343, Cl. 424-54.000.

Bloch, Bertrand: *See*—
Ropars, Marcel; and Bloch, Bertrand, 4,525,573, Cl. 528-232.000.

Blondes, Leonard S.: *See*—
Clar, Milton, 4,525,237, Cl. 156-540.000.

Bloom, Stephen R., to Perfection Automotive Products Corp. Wire wheel cover brush. 4,524,480, Cl. 15-159.00A.

Blum, Patricia R.: *See*—
Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., 4,525,471, Cl. 502-209.000.

Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, to BASF Aktiengesellschaft. Heat-setting mixtures which have a long shelf life and comprise a polyisocyanate and compounds which are reactive toward isocyanate groups, and their preparation. 4,525,570, Cl. 528-75.000.

Boardman, Peter W., to Deere & Company. Burning table. 4,524,955, Cl. 266-49.000.

Boateng, Daniel A. D.; Ball, Donald L.; and Swinkels, Godefridus M., to Cominco Ltd. Recovery of germanium from aqueous solutions. 4,525,332, Cl. 423-89.000.

Bocker, Jurgen; Gersbach, Klaus; Bethmann, Karl W.; and Glotz, Gerhard, to Rheinmetall GmbH. Projectile arrangement for a weapon having a gun barrel. 4,524,697, Cl. 102-517.000.

Bockman, Ole K., to Flakt AB. Process for the removal of impurities in reacted alumina. 4,525,181, Cl. 55-71.000.

Boden, Richard M.: *See*—
Wiegers, Wilhelmus J.; Fenn, Ronald S.; Boden, Richard M.; and Schreiber, William L., 4,524,783, Cl. 131-276.000.

Bodziak, Thomas A., to American Standard Inc. Railroad car wheel detector using hall effect element. 4,524,932, Cl. 246-247.000.

Boecker, Wolfgang D. G.; and Hailey, Laurence N., to Kennecott Corporation. Sintered silicon carbide/graphite/carbon composite ceramic body having ultrafine grain microstructure. 4,525,461, Cl. 501-90.000.

Boeder, Dieter, to Rheinmetall GmbH. Cluster bomb projectile. 4,524,694, Cl. 102-393.000.

Boeing Company, The: *See*—
Harris, Alfred W., 4,524,485, Cl. 16-364.000.
Scott, John H., 4,524,710, Cl. 114-275.000.

Boer, G. J.: *See*—
Lange, Wolfgang; and Boer, G. J., 4,525,340, Cl. 424-16.000.

Bofill, Joaquim F.: *See*—
Coll, Juan V.; Bacardit, Joan S.; and Bofill, Joaquim F., 4,524,585, Cl. 60-562.000.

Bogue, John C.: *See*—
Willcocks, Martin E. G., 4,525,855, Cl. 381-22.000.

Bohmer, Herbert: *See*—
Klein, Hans-Jorg; and Bohmer, Herbert, 4,524,867, Cl. 206-232.000.

Boisvert, Richard L.: *See*—
Masse , Lionel; and Boisvert, Richard L., 4,524,904, Cl. 232-7.000.

Boivie, Richard H., to AT&T Bell Laboratories. Character recognition arrangement. 4,525,860, Cl. 382-21.000.

Bolzer, Rene J. M.; and Clanchin, Jean, to Laiterie Triballat. Process for treating a milk serum product. 4,525,366, Cl. 426-271.000.

Bond, Ralph W., to Amana Refrigeration, Inc. Air conditioner with improved fresh air path. 4,524,588, Cl. 62-262.000.

Bond, Raymond G., to T.A.D. Avanti, Inc. Ring and line monitor for answering machine. 4,525,603, Cl. 179-84.00R.

Bonfiglioli, Silverio; and Triolo, Innocenzo, to Weber S.p.A. Carburetor having electronically controlled elements for maintaining engine idling speed at a constant level and for controlling choke-valve position during a warm-up phase. 4,524,742, Cl. 123-438.000.

Bonten, Heinz; Nielinger, Werner; Michael, Dietrich; and Haupt, Heinrich, to Bayer Aktiengesellschaft. Fire-resistant polyamide moulding compositions. 4,525,505, Cl. 524-100.000.

Booms, Herbert. Method of making level vials. 4,525,192, Cl. 65-110.000.

Borg, Arthur N., to Zenith Electronics Corporation. TV Receiver with multiplexed microprocessor keyboard scanning and channel number display. 4,525,740, Cl. 358-192.100.

Bourauel, Fritz; Flohr, Wolfgang P.; and Weishaupt, Walter, to Bayerische Motoren Werke Aktiengesellschaft. Testing installation for motor vehicle operating elements. 4,524,612, Cl. 73-117.300.

Bourgois, Luc. Steel fibre reinforced rubber article. 4,525,430, Cl. 428-625.000.

Bowen, David R.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,525,364, Cl. 426-3.000.

Bowen, Dennis H., to United Kingdom Atomic Energy Authority. Method of winding on foam mandrel. 4,525,228, Cl. 156-155.000.

Bowles, David E.: *See*—
Bowles, Romald E.; and Bowles, David E., 4,525,859, Cl. 382-5.000.

Bowles, Romald E.; and Bowles, David E. Pattern recognition system. 4,525,859, Cl. 382-5.000.

Boyer, Harriet S.: *See*—
Boyer, Ray E.; and Boyer, Harriet S., 4,524,663, Cl. 83-762.000.

Boyer, Ray E.; and Boyer, Harriet S. Power hacksaw. 4,524,663, Cl. 83-762.000.

Boyertown Casket Company: *See*—
Tehsildar, Tehmtan J.; and Colbert, Robert R., 4,524,496, Cl. 27-18.000.

Boyle, David H.; and Kouba, Daniel J., to Motorola, Inc. High performance and gate having an "natural" or zero threshold transistor for providing a faster rise time for the output. 4,525,640, Cl. 307-450.000.

BP Chemicals Limited: *See*—
Hudson, Barry, 4,525,512, Cl. 524-284.000.

Bradshaw, Richard L., to International Business Machines Corporation. Flexible magnetic recording media having a polyester-polyurethane binder and chromium dioxide pigment. 4,525,424, Cl. 428-425.900.

Brajder, Antonio, to Siemens Aktiengesellschaft. Protective circuit for a switching transistor. 4,525,765, Cl. 361-88.000.

Brandeau, Edward P., to Thomas & Betts Corporation. Method of making wire terminations. 4,524,510, Cl. 29-861.000.

Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Hydraulic release arrangement, especially for vehicle clutches. 4,524,855, Cl. 192-88.00A.

Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Hans, Rudiger, to SKF Kugellagerfabriken GmbH. Sealing ring assembly for rolling bearings. 4,525,082, Cl. 384-138.000.

Brasky, Joseph L. Self-stripping connector for insulated wires. 4,525,019, Cl. 339-98.000.

Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., to Data General Corporation. Data processing system having a memory using object-based information and a protection scheme for determining access rights to such information. 4,525,780, Cl. 364-200.000.

Bray, George A.: *See*—
Greenway, Frank L., III; and Bray, George A., 4,525,359, Cl. 514-653.000.

Brayer, Eyal, to 501 S.C.R. Engineers, Ltd. Indicating device for milking apparatus. 4,524,720, Cl. 119-14.140.

Brazel, Berthold: *See*—
Woditsch, Peter; Abels, Martin; and Brazel, Berthold, 4,525,334, Cl. 423-324.000.

Bredeweg, Roger L., to Leco Corporation. Carbon, hydrogen, and nitrogen analyzer. 4,525,328, Cl. 422-80.000.

Brehm, Gailon E.: *See*—
Lehmann, Randall E.; Brehm, Gailon E.; and Seymour, David J., 4,525,678, Cl. 330-277.000.

Bremer, Gordon; Betts, William L.; and Greene, Robert T., to Paradyne Corporation. Modem in-band secondary channel via radial modulation. 4,525,846, Cl. 375-39.000.

Bremer, Gordon, to Paradyne Corporation. QAM encoder. 4,525,847, Cl. 375-59.000.

Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., to Standard Oil Company, The. Attrition resistant microspheroidal fluid bed catalysts containing the mixed oxides of vanadium and phosphorus. 4,525,471, Cl. 502-209.000.

Brenner, Friedhelm: *See*—
Kaufmann, Heinrich; and Brenner, Friedhelm, 4,525,057, Cl. 355-3.0FU.

Breseghello, Christian: *See*—
Billard, Alain A.; Santalucia, Andre R.; and Breseghello, Christian, 4,524,670, Cl. 89-1.530.

Breslow, Jeffrey D.: *See*—
Hanson, Steven P.; and Breslow, Jeffrey D., 4,524,967, Cl. 273-1.0GE.

Breunich, Theodore R.: *See*—
Di Noia, Emanuel J.; and Breunich, Theodore R., 4,524,624, Cl. 73-708.000.

Bridges, Jack E.; Taflove, Allen; and Sresty, Guggilam C., to IIT Research Institute. Single well stimulation for the recovery of liquid hydrocarbons from subsurface formations. 4,524,827, Cl. 166-248.000.

Brisco, David P., to Halliburton Company. Tubular connecting device. 4,524,998, Cl. 285-101.000.

Bristol-Myers Company: *See*—
Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,525,473, Cl. 514-202.000.

Britax Vega Limited: *See*—
Peck, Anthony F., 4,525,772, Cl. 362-290.000.

British-American Tobacco Company Limited: *See*—
Luke, John A., 4,525,161, Cl. 493-42.000.

British Petroleum Company p.l.c., The: *See*—
Baker, Peter J.; Brookes, David A.; and Johnson, Martin, 4,525,173, Cl. 44-51.000.

Brock, Christopher W.: *See*—
Scheffer, Daniel G.; Brock, Christopher W.; and Schumer, Douglas B., 4,525,794, Cl. 364-567.000.

Brockhaus, Herbert, to Audi NsU Auto Union AG. Coupling means between an output control member of an internal combustion engine and an actuator member. 4,524,740, Cl. 123-340.000.

Brockway, Inc.: *See*—
Herring, Walter R., 4,524,883, Cl. 220-462.000.

Bron, Dan. Self-regulating sprinkler nozzle. 4,524,913, Cl. 239-222.170.

Bronstein, Leonard. Contact lens. 4,525,043, Cl. 351-160.00R.

Brookes, David A.: *See*—
Baker, Peter J.; Brookes, David A.; and Johnson, Martin, 4,525,173, Cl. 44-51.000.

Brooks, Ronald H. Improvements relating to method and apparatus for joining sheet material. 4,525,233, Cl. 156-273.900.

Broughton, George L.; Higby, Jeffrey P.; and Young, Robert F., to Outboard Marine Corporation. Marine propulsion device including ignition interruption means to assist transmission shifting. 4,525,149, Cl. 440-1.000.

Brown, George T., Jr.; and Blakely, Lewis E., Jr., to American Thermometer Co., Inc. Skin temperature indicating and recording device. 4,524,778, Cl. 128-736.000.

Brown, George T., Jr., to American Thermometer Co., Inc. Device for detecting, measuring, and recording body thermal emissivity. 4,524,779, Cl. 128-736.000.

Brown, Ivan R.: *See*—
Waldron, Joseph P.; and Brown, Ivan R., 4,524,655, Cl. 82-36.00A.

Brown, Thomas L.: *See*—
Kollmeyer, Willy D.; and Brown, Thomas L., 4,525,201, Cl. 71-76.000.

Browning, James E. Box blade with movable closure blade. 4,524,532, Cl. 37-117.500.

Bruce, Anthony R.: *See*—
Grover, William E.; and Bruce, Anthony R., 4,525,064, Cl. 355-75.000.

Brugger, Manfred; Janczer, Peter; and Peter, Hans, to BBC Brown, Boveri & Company, Limited. Centrifugal casting unit for the production of precision castings. 4,524,817, Cl. 164-290.000.

Brunelli, Timothy A.: *See*—
Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., 4,525,331, Cl. 423-54.000.

Brush, Robert W., Sr.: *See*—
Schildkraut, Alan L.; and Brush, Robert W., Sr., 4,525,017, Cl. 339-89.00M.

BTC Diagnostics Limited Partnership: *See*—
Jones, Wendy; and Gerber, Bego, 4,525,452, Cl. 435-7.000.

Bubley, Henry J., to American Screen Printing Equipment Company. Adjustable carriage drive mechanism. 4,524,687, Cl. 101-123.000.

Buc, John L. Molded container and closure. 4,524,882, Cl. 220-306.000.

Buck, Robert; Friedrich, Michael B.; Gesthuysen, Hans D.; and Marhofer, Gerd, to i f m electronic GmbH. Electronic monitoring system with malfunction indicator. 4,525,699, Cl. 340-512.000.

Buckley, Bruce S., to Buckley, Bruce Shawn. Solar collector, heat exchanger or hot water storage tank and method of forming same. 4,524,757, Cl. 126-426.000.

Buckley, Bruce Shawn: *See*—
Buckley, Bruce S., 4,524,757, Cl. 126-426.000.

Buckley, Damon S.; and Buckley, Marlene E. Carrying case for predrawn syringe. 4,524,868, Cl. 206-364.000.

Buckley, Marlene E.: *See*—
Buckley, Damon S.; and Buckley, Marlene E., 4,524,868, Cl. 206-364.000.

Budd Company, The: *See*—
Pavlick, Michael J., 4,524,699, Cl. 105-4.00R.

Budish, Joseph D. Door latch with lock. 4,524,590, Cl. 70-129.000.

Bulka, Raymond I.; Ketcham, Russell S.; and Mak, Kelvin K., to McCain Manufacturing Corporation. Book stacker. 4,525,118, Cl. 414-43.000.

Bullock, Steven S.: *See*—
Howie, John K.; and Bullock, Steven S., 4,525,289, Cl. 252-49.900.

Burba, Christian; and Franz, Herbert, to Schering AG. Epoxy resin/cycloaliphatic amine curing agent mixtures. 4,525,571, Cl. 528-111.000.

Buren, Lawrence L.: *See*—
Large, George B.; and Buren, Lawrence L., 4,525,202, Cl. 71-86.000.

Burger, Walter L.: *See*—
Elias, Moenes L.; and Burger, Walter L., 4,525,240, Cl. 156-659.100.

Burke, Thomas W.; and Klee, David J., to Air Products and Chemicals, Inc. Discharge of blasting media from a treating chamber. 4,524,550, Cl. 51-424.000.

Burkhardt, Rudolf: *See*—
Wildermuth, Eberhard; Jansen, Dirk; Burkhardt, Rudolf; and Merz, Joachim, 4,525,717, Cl. 343-452.000.

Burnham, J. Kellogg. Coordinated lathe chuck. 4,524,983, Cl. 279-110.000.

Burr-Brown Corporation: *See*—
Henry, Paul M., 4,525,663, Cl. 323-280.000.

Burrage, Eric C. Armored umbilical apparatus for towing a marine seismic air gun sub-array. 4,525,813, Cl. 367-20.000.

Burris, Lee R.: *See*—
Speer, Billy L.; Burris, Lee R.; and Rogers, Jerry W., 4,525,152, Cl. 474-133.000.

Busch, Peter; and Barbet, Karl-Heinz, to TRW Ehrenreich GmbH & Co. KG. Injection mold. 4,524,943, Cl. 249-63.000.

Buschfeld, Adolf: *See*—
Ripkens, Gerd; Schittek, Hans; and Buschfeld, Adolf, 4,525,227, Cl. 156-62.200.

Bush, Richard B.; and Evans, Edwin R., to General Electric Company. Peroxide-curable fluorosilicone copolymer compositions. 4,525,528, Cl. 524-860.000.

Bushey, Dean F.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Derivatives of bicyclic 2-iminothiazolidine oximes. 4,525,357, Cl. 514-258.000.

Butaeva, Tatyana I.: *See*—
Petrosian, Ashot G.; Bagdasarov, Khachik S.; Kuzanian, Armen S.; Ovanesian, Karine L.; and Butaeva, Tatyana I., 4,525,460, Cl. 501-86.000.

Butler, Donald E.; Hershenson, Fred M.; and Pavia, Michael R., to Warner-Lambert Company. N-[1-oxo-3-(5-oxo-2-pyrrolidinyl)-propyl]-alpha-aminoacids and derivatives as cognition activators. 4,525,476, Cl. 514-326.000.

Butler, Robert F. Process for the reversible transfer of thermal energy and heat transfer system useful therein. 4,524,759, Cl. 126-452.000.

Butler, Thomas A.: *See*—
Richmond, Carl T.; Butler, Thomas A.; and Andrews, Joseph E., Jr., 4,525,675, Cl. 328-140.000.

Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, to Olin Corporation. Adhesion primers for encapsulating epoxies. 4,525,422, Cl. 428-418.000.

Butterick Company, Inc.: *See*—
Perry, Patricia, 4,524,522, Cl. 33-11.000.

Butts, Gary C., to Apple Computer, Inc. Spiral spring keyboard switch with hairpin spring tactile feedback. 4,525,613, Cl. 200-159.00R.

Bylund, Sven O., to Santrade Ltd. Cutting tool having a cutting blade in a shank slot. 4,525,109, Cl. 407-36.000.

C. Olivetti & C., S.p.A.: *See*—
Falconieri, Remo, 4,525,089, Cl. 400-639.100.

Cache Technology Corporation: *See*—
Hackamack, Paul, 4,525,802, Cl. 364-900.000.

Calgon Corporation: *See*—
Hunter, Wood E.; and Craun, Gary P., 4,525,509, Cl. 524-141.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,524,831, Cl. 166-322.000.

Cameron, Douglas S.: *See*—
Pelletier, Charles A.; Gonso, William E., Jr.; Cameron, Douglas S.; and Leonard, Patrick R., 4,524,607, Cl. 73-40.50R.

Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., to Anicon, Inc. Substrate loading means for a chemical vapor deposition apparatus. 4,524,719, Cl. 118-719.000.

Campbell, Donald N.; and Schmidt, John C., to Allied Corporation. Enzymatic toxic gas sensor. 4,525,704, Cl. 340-632.000.

Campbell, Donald N.: *See*—
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,525,266, Cl. 204-412.000.

Campbell, John R.; and Williams, Robert E., Jr., to General Electric Company. Ionically cross-linked siloxane polymers. 4,525,567, Cl. 528-27.000.

Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government: *See*—
Cielo, Paolo G.; and McMahon, Garfield W., 4,525,818, Cl. 367-149.000.
McMahon, Garfield W.; and Armstrong, Bruce A., 4,524,693, Cl. 367-167.000.

Cane, David A., to Massachusetts Computer Corporation. Computer memory control. 4,525,778, Cl. 364-200.000.

Canon Kabushiki Kaisha: *See*—
Hashimoto, Seiji; Suga, Akira; and Tanaka, Nobuyoshi, 4,525,737, Cl. 358-44.000.
Hirabayashi, Hiromitsu; Sakurai, Masaaki; and Kagiura, Kazuo, 4,525,058, Cl. 355-3.0FU.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,525,442, Cl. 430-57.000.
Someya, Hiromi; Aihara, Yoshihiko; Mizogui, Toyokazu; and Suzuki, Nobuyuki, 4,525,054, Cl. 354-443.000.

Caniatore, Giuseppe, to Ciba-Geigy S.p.A. Piperidine derivatives which are stabilizers for synthetic polymers. 4,525,503, Cl. 524-98.000.

Canter, Joseph M.: *See*—
Agulnek, Martin A.; Canter, Joseph M.; and Reisch, Michael L., 4,525,729, Cl. 346-154.000.

Canyon Corporation: *See*—
Tada, Tetsuya, 4,524,888, Cl. 222-153.000.

Capaccio, Giancarlo; and Ward, Ian M., to National Research Development Corporation. High modulus, low creep strain polyalkene polymer materials. 4,525,564, Cl. 526-348.100.

Carbaugh, William L.: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,524,832, Cl. 166-347.000.

Carbonaro, Antonio; and Ferraro, Domenico, to Enoxy Chimica S.p.A. Process for preparing conjugate diolefins, and means suitable for this purpose. 4,525,549, Cl. 526-92.000.

Carbone, Anthony K. Method and apparatus for scanning and digitizing optical images. 4,525,748, Cl. 358-286.000.

Cardona, Ramon M.; Leno, Theodore M.; and O'Leary, Melody M., to AT&T Teletype Corporation. Paper handling apparatus with continuous drive roll and pressure finger. 4,525,087, Cl. 400-613.200.

Carl Freudenberg, Firma: *See*—
Schmidt, Klaus, 4,525,411, Cl. 428-198.000.

Carl Schenck AG.: *See*—
Arnold, Dieter, 4,524,810, Cl. 141-250.000.

Carl-Zeiss-Stiftung: *See*—
Muchel, Franz, 4,525,042, Cl. 350-519.000.

Carley, Rickey L. Straight-cut guide for saws. 4,524,662, Cl. 83-745.000.

Carlin, James W., to AT&T Bell Laboratories. Technique for cancelling antenna sidelobes. 4,525,716, Cl. 343-381.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Italiano, Pietro; and Riva, Ermete, 4,524,605, Cl. 73-38.000.

Carlson, John H., to USM Corporation. Extended flexspline arrangement. 4,524,639, Cl. 74-640.000.

Carrasquel, Angel R.: *See*—
Morales, Alfredo; Galiasso, Roberto; and Carrasquel, Angel R., 4,525,472, Cl. 502-323.000.

Carstensen, Kenneth J. Thread and bearing lubricant. 4,525,287, Cl. 252-26.000.

Carter, Charles R.: *See*—
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., 4,524,796, Cl. 137-240.000.

Cascone, Ronald F.; and Solomon, C. Ashley, to Halcon SD Group, Inc., The. Method for the production of variable amounts of power from syngas. 4,524,581, Cl. 60-39.020.

Casey, Adria C.; Adler, Alan D.; and Premuzic, Eugene T., to New England Institute, Inc., The. Methods of stimulating host defense system with coenzymes Q_8 to Q_{13}. 4,525,350, Cl. 424-94.000.

Casio Computer Co., Ltd.: *See*—
Kita, Kazunori, 4,525,075, Cl. 368-10.000.

Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Polymerizing phenothiazine stabilizer chloroprene in the presence of an initiator comprising sodium dithionate. 4,525,561, Cl. 526-220.000.

Castelein, Jean: *See—*
Bertrand, Jean-Noel; and Castelein, Jean, 4,525,533, Cl. 525-98.000.

Castle, Richard M.: *See—*
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.

Cau, Egidio; and Lamiral, Jean P., to Lignes Telegraphiques et Telephoniques. Process for time-sequenced multiplexing of data on a transmission medium and devices to implement this process. 4,525,833, Cl. 370-99.000.

Caughie, Keith E.; and Caughie, Kenneth L. Football game board. 4,524,975, Cl. 273-247.000.

Caughie, Kenneth L.: *See—*
Caughie, Keith E.; and Caughie, Kenneth L., 4,524,975, Cl. 273-247.000.

Caussarieu, Frederic: *See—*
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.

Cawley, Wesley D. Apparatus for picking up, carrying and releasing articles. 4,525,121, Cl. 414-564.000.

Cawrse, Frank; Cawrse, George F.; and Cawrse, Frank W. Apparatus for collecting and unloading hay bales and the like. 4,525,119, Cl. 414-111.000.

Cawrse, Frank W.: *See—*
Cawrse, Frank; Cawrse, George F.; and Cawrse, Frank W., 4,525,119, Cl. 414-111.000.

Cawrse, George F.: *See—*
Cawrse, Frank; Cawrse, George F.; and Cawrse, Frank W., 4,525,119, Cl. 414-111.000.

Cechanski, Michael, to Atlas Powder Company. Solid water-in-oil emulsion explosives compositions and processes. 4,525,225, Cl. 149-19.500.

Cecos International, Inc.: *See—*
Zawadzki, Stanley C., Jr.; Stadelmaier, Robert A.; and Perrone, John J., 4,525,100, Cl. 405-129.000.

Celanese Corporation: *See—*
DeGooyer, William J., 4,525,542, Cl. 525-484.000.

Centennial Jewelers, Inc.: *See—*
Finkler, Saul M., 4,524,525, Cl. 33-178.00B.

Centeny, Norman L., to Schwinn Bicycle Company. Laminated, reinforced fork end fitment connector for a bicycle and process for manufacturing same. 4,524,989, Cl. 280-281.00R.

Centralen Savet na Nauchnotechnicheski Sayusi: *See—*
Tzvetkov, Krum K., 4,525,787, Cl. 364-470.000.

Centre de Recherche Industrielle de Quebec: *See—*
Altounian, George N., 4,525,574, Cl. 528-283.000.

Centre Technique Industriel Dit: Insttiut Textile de France: *See—*
Edme , Jacques; and Deffontaine, Etienne, 4,525,705, Cl. 340-677.000.

Cessna Aircraft Company, The: *See—*
Barnes, Pierre D.; and Marts, Maynard W., 4,524,947, Cl. 251-129.000.

Chahal, Maninderpal S.; and Therrien, Roger H., to NCR Corporation. Self-adjusting video camera. 4,525,741, Cl. 358-212.000.

Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., to Allied Corporation. Temperature compensated orientations of berlinite for surface acoustic wave devices. 4,525,643, Cl. 310-313.00A.

Chaker, Mouhanad; Clark, Roger J.; and Hayes, James S. High flash point/low surface energy solvent systems for polyimide conformal coatings. 4,525,507, Cl. 524-104.000.

Chamberlain, Lewis W. Universal locking device. 4,524,872, Cl. 211-4.000.

Chambers, Worthy L.: *See—*
Jones, William H.; and Chambers, Worthy L., 4,525,697, Cl. 337-354.000.

Champion International Corporation: *See—*
Roccaforte, Harry I.; and Christie, Robert A., 4,524,870, Cl. 206-608.000.

Champoux, Robert L.; and Copple, Charles M. Apparatus for prestressing fastener holes. 4,524,600, Cl. 72-391.000.

Chang, Eugene Y. C., to American Cyanamid Company. Storage stable, one-package heat curable polyurethane adhesive compositions. 4,525,568, Cl. 528-60.000.

Chapalain, Jean-Pierre. Device for locking straps at the time of lifting loads, with possible adjustment of their useful length. 4,525,007, Cl. 294-74.000.

Chapman, Christopher P., to De La Rue Systems Limited. Apparatus for detecting tape on sheets. 4,525,630, Cl. 250-572.000.

Chappell, Austin W. Detachable car seat tables. 4,524,701, Cl. 108-44.000.

Chappell, Terry I.; Jackson, Thomas N.; and Woodall, Jerry M., to International Business Machines Corporation. Semiconductor conversion of optical-to-electrical energy. 4,525,731, Cl. 357-12.000.

Chastagner, Paul, to Regie Nationale des Usines Renault. Process and device for controlling the idling speed of a heat engine. 4,524,738, Cl. 123-339.000.

Chauvin, Richard: *See—*
McAuliffe, Lawrence, Jr.; and Chauvin, Richard, 4,524,743, Cl. 123-438.000.

Chemische Werke Huels AG: *See—*
Sielfeld, Gilbert; and de Jong, Rudolf, 4,525,559, Cl. 526-200.000.

Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., to AT&T Bell Laboratories. High speed light modulator using multiple quantum well structures. 4,525,687, Cl. 332-7.510.

Chen, Li F.; and Yang, Che-Ming, to Purdue Research Foundation. Selective hydrolysis of cellulose to glucose without degradation of glucose using zinc chloride. 4,525,218, Cl. 127-37.000.

Cheney, Ronald W.: *See—*
Miller, Harold E.; and Cheney, Ronald W., 4,524,764, Cl. 128-80.00C.

Cheng, Paul J. Self-cleaning heat exchanger. 4,524,725, Cl. 122-7.00R.

Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., to GTE Products Corporation. Process for purifying molybdenum trioxide. 4,525,331, Cl. 423-54.000.

Cheslow, Ernest: *See—*
Khalil, Ezzat N.; and Cheslow, Ernest, 4,524,787, Cl. 132-7.000.

Chesney, Lloyd: *See—*
Hayes, Daniel F.; Sias, Robert G.; Chesney, Lloyd; and Waldron, John W., 4,525,253, Cl. 204-149.000.

Chevron Research Company: *See—*
Klee, Howard W., Jr., 4,525,338, Cl. 423-573.00G.

Chiba, Fumitaka; and Shimizu, Kyozo, to Nippon Electric Co., Ltd. Integrated circuit. 4,525,809, Cl. 365-51.000.

Chiba, Shu: *See—*
Higashiyama, Yasushi; Chiba, Shu; and Sawazaki, Norikazu, 4,525,828, Cl. 369-111.000.

Chicago Bridge & Iron Company: *See—*
Laverman, Royce J., 4,524,756, Cl. 126-400.000.

Chicopee: *See—*
Ness, Irving S., 4,525,407, Cl. 428-138.000.

Childress, Timothy T.: *See—*
D'Angelo, Kenneth R.; and Childress, Timothy T., 4,524,963, Cl. 271-3.100.

Childs, Jerry D.: *See—*
Sabins, Fred; and Childs, Jerry D., 4,524,828, Cl. 166-293.000.

Chin, Tung Jin: *See—*
Yamasaki, Hiro; Chin, Tung Jin; and Akiyama, Chuji, 4,524,627, Cl. 73-861.120.

China Steel Corporation: *See—*
Maw-Cheng, Shieh; Seng-Jung, Chen; Li-Jung, Hu; and Jin-Luh, Su, 4,525,210, Cl. 75-58.000.

Chister, Rene . Tobacco smoking pipe having self-contained cleaning assembly. 4,524,782, Cl. 131-180.000.

Chiu, Herman S., to Union Carbide Corporation. Liquid smoke treated cellulosic food casings. 4,525,397, Cl. 428-36.000.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Inooka, Masayoshi, 4,525,267, Cl. 208-58.000.

Chloride Group Public Limited Company: *See—*
Pearson, Ernest J., 4,525,438, Cl. 429-149.000.

Chou, Clifford C.: *See—*
Hargunani, Ashok B.; and Chou, Clifford C., 4,524,603, Cl. 73-12.000.

Chou, Ta-Sen; and Heath, Perry C., to Eli Lilly and Company. Process for preparing a cephalosporin compound. 4,525,587, Cl. 544-025.000.

Chr. Hansen's Laboratory, Inc.: *See—*
Gehrman, Sybil H.; and Porubcan, Randolph S., 4,525,351, Cl. 424-95.000.

Christie, Robert A.: *See—*
Roccaforte, Harry I.; and Christie, Robert A., 4,524,870, Cl. 206-608.000.

Chrysler Corporation: *See—*
Miller, Kenneth L., 4,525,850, Cl. 377-19.000.

Chu, Kuo-Chin. Electromagnetically-induced rocking clock. 4,525,078, Cl. 368-134.000.

Chung, Charng J. Fixation tweezers. 4,524,648, Cl. 294-99.200.

Church, Peter K., to El-Chem Corporation. Water and oil repellent metal oxide-organic combination coating systems and method of making same. 4,525,425, Cl. 428-428.000.

Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie, 4,525,583, Cl. 534-606.000.
Balliello, Paolo, 4,525,170, Cl. 8-524.000.
Diethelm, Hermann; and Zahir, Sheik A., 4,525,572, Cl. 528-170.000.
Zink, Rudolf, 4,525,588, Cl. 544-89.000.

Ciba-Geigy S.p.A.: *See—*
Cantatore, Giuseppe, 4,525,503, Cl. 524-98.000.

Cielo, Paolo G.; and McMahon, Garfield W., to Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Stable fiber-optic hydrophone. 4,525,818, Cl. 367-149.000.

Cincinnati Incorporated: *See—*
Lucas, Delbert E.; and Lieland, Stephen J., 4,524,582, Cl. 60-421.000.

Citizen Watch Co., Ltd.: *See—*
Murakami, Tomomi, 4,525,074, Cl. 368-10.000.

Claes, Roger G., to GTE Products Corporation. Electroacoustic delay lines. 4,525,692, Cl. 333-142.000.

Clanchin, Jean: *See—*
Bolzer, Rene J. M.; and Clanchin, Jean, 4,525,366, Cl. 426-271.000.

Clancy, Gerald F.: *See—*
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.

Clar, Milton, to Blondes, Leonard S., a part interest. Method of reinforcing loose-leaf sheets and disposable reinforcing tab applicator therefor. 4,525,237, Cl. 156-540.000.

Clarion Co., Ltd.: *See—*
Hamada, Masanori; and Ono, Sadao, 4,525,869, Cl. 455-277.000.
Takai, Kazuki; Hakumoto, Mitsuhiro; and Yamada, Yasuo, 4,525,756, Cl. 360-75.000.

Clark, Alfred L. Positioning jig for positioning copy material for offset printing. 4,525,062, Cl. 355-72.000.

Clark, Henry B., Jr.: *See—*
Marshall, John; and Clark, Henry B., Jr., 4,524,908, Cl. 236-46.00R.

Clark, Roger J.: *See—*
Chaker, Mouhanad; Clark, Roger J.; and Hayes, James S., 4,525,507, Cl. 524-104.000.

Clarke, Beresford N. Recuperator. 4,524,752, Cl. 126-91.00A.

Class, Eberhard; Schweizer, Heiner; and Frank, Gunther, to ULO-Werk Moritz Ullmann GmbH & Co. KG. Speed governor for motor vehicles. 4,524,843, Cl. 180-179.000.

Class, Walter H.; Hurwitt, Steven D.; and Hill, Michael L., to Materials Research Corporation. Magnetron reactive bias sputtering method and apparatus. 4,525,262, Cl. 204-192.00R.

Claussen, Nils; Ruhle, Manfred; and Petzow, Gunter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften. Ceramic body of zirconium dioxide (ZrO_2) and method for its preparation. 4,525,464, Cl. 501-103.000.

Clay, Sandra B.: *See—*
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,525,266, Cl. 204-412.000.

Clayton Dewandre Co., Ltd.: *See—*
Thistleton, John S., 4,525,128, Cl. 417-550.000.

Cleveland, Ronald N.: *See—*
Cochran, John M., Jr.; and Cleveland, Ronald N., 4,524,839, Cl. 177-45.000.

Clifford, William S.: *See—*
Trickey, Peter W.; Netherway, David C.; and Clifford, William S., 4,525,010, Cl. 297-216.000.

Cline, Harvey E.; Holik, Andrew S.; and Lorensen, William E., to General Electric Company. Method and apparatus for reconstruction of three-dimensional surfaces from interference fringes. 4,525,858, Cl. 382-1.000.

Clinton, Peter, to Smiths Industries Public Limited Company. Unidirectional capacitive fluid-gauging systems. 4,525,792, Cl. 364-509.000.

Cochran, John M., Jr.; and Cleveland, Ronald N., to Frontier Electronics, Inc. Apparatus for monitoring tare weight in a fiber blending line. 4,524,839, Cl. 177-45.000.

Cochran, William H.; and Wu, Philip T., to International Business Machines Corporation. Semiconductor memory capable of both read/write and read-only operation. 4,525,810, Cl. 365-102.000.

Cocks, Eric H., to Spraymation, Inc. Filter for adhesive applicator. 4,524,887, Cl. 222-146.500.

Coffey, Cynthia L.: *See—*
Lanner, Michael; and Coffey, Cynthia L., 4,524,721, Cl. 119-17.000.

Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, to Databit, Inc.; and Ouest Standard Telematique. Advanced network processor. 4,525,830, Cl. 370-60.000.

Colbert, Robert R.: *See—*
Tehsildar, Tehmtan J.; and Colbert, Robert R., 4,524,496, Cl. 27-18.000.

Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group p.l.c. Antibiotics. 4,525,352, Cl. 424-114.000.

Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group p.l.c. Antibiotics. 4,525,353, Cl. 424-114.000.

Cole, Stephen J., to Yakima, Inc. Bicycle carrier. 4,524,893, Cl. 224-319.000.

Coleman, William M., III; and Edmondson, Morris S., to Dow Chemical Company, The. Polymerization of olefins. 4,525,556, Cl. 526-125.000.

Colgate-Palmolive Company: *See—*
Magnasco, Enrico; and Viale, Giorgio, 4,524,801, Cl. 137-567.000.

Coll, Juan V.; Bacardit, Joan S.; and Bofill, Joaquim F., to Bendiberica /S.A. Short master-cylinder. 4,524,585, Cl. 60-562.000.

Colman, Joseph C., to Walker Machine and Foundry Company. Load holder guard. 4,525,113, Cl. 410-41.000.

Colt Industries Operating Corp.: *See—*
McAuliffe, Lawrence, Jr.; and Chauvin, Richard, 4,524,743, Cl. 123-438.000.

Combustion Engineering, Inc.: *See—*
Hill, Frank P., Jr.; Alden, John W., Jr.; and Williams, Harry K., 4,524,729, Cl. 122-498.000.

Comes, Heinrich: *See—*
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.

Cominco Ltd.: *See—*
Boateng, Daniel A. D.; Ball, Donald L.; and Swinkels, Godefridus M., 4,525,332, Cl. 423-89.000.

Commissariat a l'Energie Atomique: *See—*
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,525,337, Cl. 423-449.000.
Jouve, Hubert; and Magnin, Joel, 4,525,807, Cl. 365-36.000.

Compagnie Europeenne d'Accumulateurs: *See—*
Bardin, Roland; Mack, Joel; and Counioux, Jean-Jacques, 4,525,327, Cl. 420-565.000.

Compagnie Neerlandaise de l'Azote: *See—*
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., 4,525,198, Cl. 71-28.000.

Condon, Larry J. Heater using hot waste flue gases. 4,524,910, Cl. 237-81.000.

Conner, Randall C., to American Cast Iron Pipe Company. Method of assembling a pipe joint. 4,524,505, Cl. 29-453.000.

Construction-Gerance-Exploitation "CONGEX" : *See—*
Sauget, Bernard, 4,525,154, Cl. 493-154.000.

Container Specialties, Inc. (by Kleman): *See—*
Darlington, Rex F., 4,524,750, Cl. 124-23.00R.

Continental Group, Inc., The: *See—*
Pocock, John F. E.; Mahajan, Gautam K.; Krishnakumar, Suppayan M.; and Friendship, Kenneth F. M., 4,525,401, Cl. 428-64.000.

Contraves AG: *See—*
Hanseler, Urs; Meier, Urs; and Muther, Franz, 4,525,771, Cl. 361-413.000.

Conway, Paul: *See—*
Rooney, John M.; Woods, John; and Conway, Paul, 4,525,232, Cl. 156-273.300.
Rooney, John M.; and Conway, Paul, 4,525,553, Cl. 526-120.000.

Coon, Clifford L.: *See—*
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,525,252, Cl. 204-101.000.

Cooper, Ian V., to Dow Corning Corporation. Dewatering of mineral slurries. 4,525,279, Cl. 210-728.000.

Cooper, Ian V., to Dow Corning Corporation. Dewatering of mineral slurries. 4,525,281, Cl. 210-735.000.

Cooper Thermometer Company, The: *See—*
Krehel, Charles A.; and Kaniwec, George N., 4,524,617, Cl. 73-296.000.

Copple, Charles M.: *See—*
Champoux, Robert L.; and Copple, Charles M., 4,524,600, Cl. 72-391.000.

Corbi, Ronald W. Preset throttle release device. 4,524,741, Cl. 123-342.000.

Cordes, Harry D.; Haberer, Thomas G.; and Verrando, Marcel G., III, to Pall Corporation. Valves for desiccant dryers. 4,525,183, Cl. 55-179.000.

Cordiano, Ettore, to Corint S.r.L. Valve for power-steering systems. 4,524,631, Cl. 74-388.0PS.

Corint S.r.L.: *See—*
Cordiano, Ettore, 4,524,631, Cl. 74-388.0PS.

Cornely, Wolfgang: *See—*
Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans, 4,525,103, Cl. 405-261.000.

Corzine, Robert G.; and Mosko, Joseph A., to United States of America, Navy. Integrated spiral antenna and printed circuit balun. 4,525,720, Cl. 343-895.000.

Coulter Electronics, Inc.: *See—*
Groves, Michael R., 4,525,666, Cl. 324-71.100.

Counioux, Jean-Jacques: *See—*
Bardin, Roland; Mack, Joel; and Counioux, Jean-Jacques, 4,525,327, Cl. 420-565.000.

Crass, Gunther: *See—*
Hammerschmidt, Peter; and Crass, Gunther, 4,525,416, Cl. 428-220.000.

Craun, Gary P.; and DeGraaf, Henry J., to SCM Corporation. Aqueous glycoluril thermosetting coating. 4,525,535, Cl. 525-163.000.

Craun, Gary P.: *See—*
Hunter, Wood E.; and Craun, Gary P., 4,525,509, Cl. 524-141.000.

Crawford & Russell, Inc.: *See—*
Horowitz, Franklin B.; Pfeffer, Martin; and Hertanu, Herold T., 4,525,071, Cl. 366-152.000.

Crean, Peter A., to Xerox Corporation. Ink jet interlace strategy. 4,525,721, Cl. 346-1.100.

Crist, Robert M. Mail box signal device. 4,524,905, Cl. 232-35.000.

Croudace, Michael C., to Union Oil Company Of California. Method and fuel composition for control of octane requirement increase. 4,525,174, Cl. 44-68.000.

Crow, Robert W.: *See—*
Hilts, Robert L.; and Crow, Robert W., 4,524,833, Cl. 166-381.000.

Crowley, Raymond R.; and Soderberg, John H., to Pitney Bowes Inc. Electronic postage meter having a one time actuable operating program to enable setting of critical accounting registers to predetermined values. 4,525,786, Cl. 364-466.000.

Crowther, Paul A., to Marconi Company Limited, The. Sonar arrangements. 4,525,816, Cl. 367-123.000.

Cruz, Claude A.; and Vermeulen, Johannes C., to International Business Machines Corporation. Flip-flop programmer using cascaded logic arrays. 4,525,641, Cl. 307-465.000.

Culbertson, Edwin C.: *See—*
Posey, Robert G.; and Culbertson, Edwin C., 4,525,419, Cl. 428-336.000.

Culp, Murl F.: *See—*
Lindgren, Matts J.; and Culp, Murl F., 4,524,930, Cl. 244-152.000.

Curci, Alfred. Rotary wing aircraft. 4,525,123, Cl. 416-115.000.

Curran, Kevin G.; Golson, Steven E.; and Rode, Christian S., to General Computer Corporation. Software protection methods and apparatus. 4,525,599, Cl. 178-22.080.

Curran, Paul F.; and Marshall, Hubert T., II, to Texaco Inc. Method and system for measuring the speed of a ship. 4,524,615, Cl. 73-181.000.

Curtis, Lee J.: *See—*
Lynham, Thomas F.; and Curtis, Lee J., 4,524,483, Cl. 16-114.00R.

Cusano, Dominic A.: *See—*
DiBianca, Frank A.; Georges, Jean-Pierre J.; Cusano, Dominic A.; and Greskovich, Charles D., 4,525,628, Cl. 250-367.000.

Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Preparation of polyaddition products of Mannich condensates and polyisocyanates in polyols and their use in polyurethanes. 4,525,488, Cl. 521-164.000.

Cushing, Donald S., to General Electric Company. Timer mechanism with improved interval accuracy. 4,525,608, Cl. 200-38.00R.

Cushman, Mark E.; and Gilbert, Lawrence A. Bleaching detergent compositions comprising sulfosuccinate bleach promoters. 4,525,292, Cl. 252-102.000.
Cusumano, Salvatore V., to G & G Sewing Machine Co., Inc. Accessory-holding jig providing multiple sewing positions. 4,524,704, Cl. 112-105.000.
CVI Incorporated: *See—*
Jensen, Jack E., 4,524,586, Cl. 62-6.000.
Daar, Yair; and Yahav, Shimon. Apparatus for hair removal. 4,524,772, Cl. 128-355.000.
Dai Nippon Toryo Co., Ltd.: *See—*
Hayashi, Masaaki; and Sasaki, Hiroharu, 4,525,499, Cl. 523-523.000.
Daicel Chemical Industries, Ltd.: *See—*
Taguchi, Atsushi; and Ohmiya, Takeo, 4,525,585, Cl. 536-98.000.
Watanabe, Shoji; and Okitsu, Kiyoshi, 4,525,258, Cl. 204-159.230.
Daimler-Benz Aktiengesellschaft: *See—*
Wohlfarth, Dieter; and Kostelezky, Walter, 4,525,782, Cl. 364-431.010.
Dainippon Ink and Chemicals Inc.: *See—*
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, 4,525,303, Cl. 260-239.55R.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Maeda, Kiyoshi; and Kawatani, Masafumi, 4,525,749, Cl. 358-290.000.
Takagi, Tsuneo; and Yonehara, Hiroyuki, 4,525,065, Cl. 355-77.000.
Dall'Aglio, Carlo: *See—*
Golinelli, Guido; and Dall'Aglio, Carlo, 4,524,523, Cl. 33-143.00L.
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, to Imperial Chemical Industries Limited. Process for the extraction of metal values and novel metal extractants. 4,525,330, Cl. 423-24.000.
Damas Maskinfabrik A/S: *See—*
Ewald, Ole, 4,525,271, Cl. 209-303.000.
D'Amelia, Ronald P.; Stroz, John J.; and White, Roy, to Nabisco Brands, Inc. Single compatibilizing agents for elastomer-resin combination gum base. 4,525,363, Cl. 426-3.000.
Damen, Theodoor C.: *See—*
Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., 4,525,687, Cl. 332-7.510.
Danfoss A/S: *See—*
Lehmann, Kjeld, 4,525,769, Cl. 361-386.000.
Romer, Bendt W., 4,524,806, Cl. 137-856.000.
D'Angelo, Kenneth R.; and Childress, Timothy T., to Scan-Optics, Inc. Document handling device. 4,524,963, Cl. 271-3.100.
Dangers, Gerard: *See—*
Genetay, Michel; and Dangers, Gerard, 4,524,500, Cl. 29-157.00R.
Danielson, Carl O.; Gustafsson, Bo B.; Richardsson, Gote E.; and Lundh, Karl-Erik, to Pharmacia AB. Closure device. 4,524,880, Cl. 220-288.000.
Darlington, Rex F., to Container Specialties, Inc. (by Kleman). Archery bow and cable positioner. 4,524,750, Cl. 124-23.00R.
Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted thiocarbamate prostaglandin analogs useful as cardiovascular agents. 4,525,479, Cl. 514-469.000.
Da Silva, Artur F., to U.S. Philips Corporation. Hair-drier with valves for controlling the air flow. 4,525,623, Cl. 219-373.000.
Data General Corporation: *See—*
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.
Databit, Inc.: *See—*
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.
Davenport, Harold D.; and DeVito, Anthony J., to Penn Lithographics, Inc. Pre-fold, web scoring apparatus for signature folding machines. 4,524,962, Cl. 270-21.100.
Davids, Martin; Blackman, Peter; and Teo, Lily, to Reuters Ltd. Conversational video system. 4,525,779, Cl. 364-200.000.
Davis, Walter G., to NesTier Corporation. Removable poultry nest bottoms of variable widths. 4,524,723, Cl. 119-45.00R.
Day, Robert H., to S.D.S. Industries, Inc. Connector for tubular frame members. 4,525,099, Cl. 403-371.000.
Dayco Corporation: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.
Speer, Billy L.; Burris, Lee R.; and Rogers, Jerry W., 4,525,152, Cl. 474-133.000.
Wilson, Leslie B., 4,525,153, Cl. 474-138.000.
Dayton, Birney D.; and Leavitt, Dale L., to Grass Valley Group, Inc., The. Circuit for converting a logical signal into two balanced logical signals. 4,525,836, Cl. 370-67.000.
De La Rue Systems Limited: *See—*
Chapman, Christopher P., 4,525,630, Cl. 250-572.000.
de la Sota Martinez, Alejandro. Chair changeable into easy chair. 4,525,009, Cl. 297-118.000.
De Bijl, Adrianus M. J.; and Melai, Henri A. I., to U.S. Philips Corporation. DC/AC Converter with voltage dependent timing circuit for discharge lamps. 4,525,648, Cl. 315-224.000.
Debry, Paul. Wax tool. 4,524,713, Cl. 118-102.000.
DeCarlo, Alfred F., Jr., to Joint Medical Products Corp. Apparatus for constraining a socket bearing in an artificial joint. 4,524,467, Cl. 603-22.000.
Deere & Company: *See—*
Boardman, Peter W., 4,524,955, Cl. 266-49.000.
Deffontaine, Etienne: *See—*
Edme , Jacques; and Deffontaine, Etienne, 4,525,705, Cl. 340-677.000.
Defrance, Michel: *See—*
Hareng, Michel; Perbet, Jean-Noel; and Defrance, Michel, 4,525,709, Cl. 340-719.000.
Defuans, Jean-Louis. Objective lens. 4,525,039, Cl. 350-465.000.
DeGooyer, William J., to Celanese Corporation. Novolac based epoxy resin curing agents for use in solvent. 4,525,542, Cl. 525-484.000.
DeGraaf, Henry J.: *See—*
Craun, Gary P.; and DeGraaf, Henry J., 4,525,535, Cl. 525-163.000.
De Grave, Isidoor: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,525,484, Cl. 521-56.000.
Deihl, Joseph A., to Mayor Pharmaceutical Laboratories, Inc. Method of administering vitamins. 4,525,341, Cl. 424-43.000.
Deisz, George A.: *See—*
Tung, William C. T.; and Deisz, George A., 4,525,524, Cl. 524-601.000.
de Jong, Rudolf: *See—*
Sielfeld, Gilbert; and de Jong, Rudolf, 4,525,559, Cl. 526-200.000.
de Lannoy, Jean: *See—*
Baltes, Eugene ; de Lannoy, Jean; and Rodriguez, Ludovic, 4,525,358, Cl. 514-255.000.
Del Fabro, Giorgio: *See—*
Del Fabro, Marcello; and Del Fabro, Giorgio, 4,524,656, Cl. 83-23.000.
Del Fabro, Marcello; and Del Fabro, Giorgio, to SAE s.r.l. Method for cutting metal rods into shorter lengths. 4,524,656, Cl. 83-23.000.
DeMunda, Gabriel P.: *See—*
Kaiser, Gregory A.; DeMunda, Gabriel P.; and Tressler, Richard E., 4,525,429, Cl. 428-566.000.
DenHartog, Herman C.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Coating composition of an acrylic polymer having amino ester groups and a glycidyl acrylic polymer. 4,525,521, Cl. 524-517.000.
Dennison, William G.; Horr, Kenneth R.; and Kindler, Robert I., to Eaton Corporation. Electromagnetic contactor. 4,525,694, Cl. 335-132.000.
Dent, Hugh R., to Sterimatic Holdings Limited. Fitments for containers from which liquid is intended to be withdrawn by a hollow needle or tube. 4,524,809, Cl. 141-1.000.
Dentsply Research & Development Corp.: *See—*
Plowman, Richard E.; and VanLenten, James A., 4,524,816, Cl. 164-287.000.
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Raubenheimer, Hans-Jurgen, to BASF Aktiengesellschaft. Increasing the efficiency of high molecular weight crosslinked polycarboxylic acids. 4,525,581, Cl. 528-503.000.
De Ronde, Frans C., to U.S. Philips Corporation. N-port coupler. 4,525,690, Cl. 333-116.000.
De Roo, Pierre R.; and Tavernier, Serge M., to Agfa-Gevaert N.V. Electrostatic toner comprising thermoplastic resin binder for nigrosine base salt. 4,525,445, Cl. 430-109.000.
DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,525,510, Cl. 524-156.000.
Sekmakas, Kazys; and Murphy, Edward J., 4,525,543, Cl. 525-529.000.
Despois, Claude: *See—*
Rebourg, Jean-Claude; and Despois, Claude, 4,525,798, Cl. 364-826.000.
Detty, Michael R.; and Perlstein, Jerome H., to Eastman Kodak Company. Novel 3-trihalochalcogenpropenone compounds. 4,525,443, Cl. 430-83.000.
Deutschbein, Ulrich: *See—*
Reil, Wilhelm; Deutschbein, Ulrich; and Wallich, Manfred, 4,525,318, Cl. 264-259.000.
Deutsche Fibrit Gesellschaft Ebers & Dr. Muller mbH: *See—*
Tonniges, Heinz, 4,525,321, Cl. 264-517.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Hamel, Peter; and Karmann, Rudiger, 4,525,784, Cl. 364-434.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Spilker, Harry; and Einfeld, Klaus, 4,525,324, Cl. 376-272.000.
Deutsche Nemectron GmbH: *See—*
Hildebrandt, Jurgen, 4,524,774, Cl. 128-421.000.
Deutsche Spezialglas AG: *See—*
Behr, Werner, 4,525,462, Cl. 501-71.000.
Deutsche Texaco Aktiengesellschaft: *See—*
Bartsch, Erich O.; and Vollstedt, Gerald, 4,525,282, Cl. 210-747.000.
Ripkens, Gerd; Schittek, Hans; and Buschfeld, Adolf, 4,525,227, Cl. 156-62.200.
Develcon Electronics Ltd.: *See—*
Dodds, David E.; and Bertsch, Ludo A., 4,525,845, Cl. 375-36.000.
Develop Dr. Eisbein GmbH & Co.: *See—*
Eisbein, Jurgen, 4,525,063, Cl. 355-72.000.
Kaufmann, Heinrich; and Brenner, Friedhelm, 4,525,057, Cl. 355-3.0FU.
Deverell, Harry E.; and Beigay, Jack M., to Allegheny Ludlum Steel Corporation. Method of welding ferritic and austenitic stainless steels and product thereof. 4,525,620, Cl. 219-137.0WM.

DeVito, Anthony J.: *See*—
Davenport, Harold D.; and DeVito, Anthony J., 4,524,962, Cl. 270-21.100.
De Volder, Noel J.: *See*—
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., 4,525,446, Cl. 430-117.000.
DeVries, Douglas C.: *See*—
Mallalieu, David H.; Apostola, Samuel N.; and DeVries, Douglas C., 4,524,514, Cl. 30-169.000.
DeWerth, Douglas W.; and Sheridan, Roger D., to Gas Research Institute. Regulation of blue flame combustion emissions. 4,525,141, Cl. 431-347.000.
De Winter, Walter F.: *See*—
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., 4,525,446, Cl. 430-117.000.
de Zbikowski, Juan L. Functional attachment system for osteosynthesis by means of compression plates. 4,524,765, Cl. 128-92.00D.
Deziel, Edward W. Enclosure assembly. 4,524,814, Cl. 160-133.000.
Diana, Giorgio, to A. Salvi & C. S.p.A. Damping spacer for bundle conductors of high-voltage electric lines, with improved damping effectiveness. 4,525,596, Cl. 174-42.000.
Diasonics, Inc.: *See*—
Terwilliger, Richard A., 4,524,623, Cl. 73-633.000.
Diaz, Joe; and Spector, George. Electric socket wrench. 4,524,649, Cl. 81-57.130.
DiBianca, Frank A.; Georges, Jean-Pierre J.; Cusano, Dominic A.; and Greskovich, Charles D., to General Electric Company. Rare earth ceramic scintillator. 4,525,628, Cl. 250-367.000.
DiBuo, Louis J.; Solt, Paul E.; and Souders, Marvyn L., to Fuller Company. Pneumatic conveying device. 4,525,106, Cl. 406-60.000.
DiCostanzo, Pam, to PD Giftware Designs, Inc. Novelty greeting gift apparatus. 4,525,393, Cl. 428-7.000.
Didde Graphic Systems Corporation: *See*—
Rodvelt, Ronnie L., 4,524,692, Cl. 101-350.000.
Dieck, Ronald L.: *See*—
Zukosky, Mimzee; and Dieck, Ronald L., 4,525,531, Cl. 525-92.000.
Diels, Jean-Claude, to United States of America, Navy. Ring laser with wavefront conjugating beams. 4,525,843, Cl. 372-94.000.
Diesel Kiki Co., Ltd.: *See*—
Kaibara, Nobuhiro; Ida, Toshio; Okuda, Shinji; and Motohashi, Takayuki, 4,524,914, Cl. 239-452.000.
Uchida, Kazuo, 4,524,613, Cl. 73-119.00A.
Diethelm, Hermann; and Zahir, Sheik A., to Ciba-Geigy Corporation. Heat-curable mixtures, stable on storage, based on polyimides and containing polymerization catalysts. 4,525,572, Cl. 528-170.000.
Digby, James J., to Facet Enterprises, Inc. Compact engine starter drive. 4,524,629, Cl. 74-7.00R.
Dimigen, Heinz; and Hubsch, Hubertus, to U.S. Philips Corporation. Carbon-containing sliding layer. 4,525,417, Cl. 428-244.000.
Dinklage, Horst; Fink, Herbert; and Wolf, Hans-Peter, to Rohm GmbH. Two-layered packaging material for foodstuffs one layer of which comprises a polymer blend. 4,525,418, Cl. 428-264.000.
Di Noia, Emanuel J.; and Breunich, Theodore R., to Peerless Nuclear Corporation. Pressure and differential pressure detectors and transmitter for use in hostile environment. 4,524,624, Cl. 73-708.000.
Dipper, Barry: *See*—
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Dirksing, John W.: *See*—
Keyes, Richard E.; and Dirksing, John W., 4,524,916, Cl. 241-101.00A.
Dislich, Heinz; and Richter, Horst, to Dislich, Heinz; and Krupp Stahl Aktiengesellschaft, part interest to each. Spout-filling mass. 4,525,463, Cl. 501-99.000.
Dissett, Walter L.: *See*—
Neumann, Lawrence T.; and Dissett, Walter L., 4,524,640, Cl. 74-650.000.
Dodds, David E.; and Bertsch, Ludo A., to Develcon Electronics Ltd. Balanced circuit for connecting receiver and transmitter to transmission line. 4,525,845, Cl. 375-36.000.
Doell, Brant; and Wright, John T., to Doellwood Financial, Inc. Method for improving fuel efficiency and reduced emissions in internal combustion engines. 4,524,730, Cl. 123-27.0GE.
Doellwood Financial, Inc.: *See*—
Doell, Brant; and Wright, John T., 4,524,730, Cl. 123-27.0GE.
Doessel, Karl-Friedrich, to Hoechst Aktiengesellschaft. Electrophotographic recording material. 4,525,444, Cl. 430-96.000.
Dolp, Heinrich. Device for accommodating billiard balls in spaces provided for billiards playing. 4,524,968, Cl. 273-2.000.
Donaher, Thomas P.: *See*—
Hesselberth, Robert J.; Donaher, Thomas P.; and Sandahl, Joel E., 4,525,685, Cl. 331-10.000.
Donets, Oleg V.: *See*—
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.
Donnelly Corporation: *See*—
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Dorman, Linneaus C.; and Meyers, Paul A., to Dow Chemical Company, The. Mineral filled composites. 4,525,495, Cl. 523-205.000.
Dorn, Friedrich-Wilhelm: *See*—
Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, 4,525,329, Cl. 422-202.000.
Dornier GmbH: *See*—
Schmidt, Wolfgang; and Longo, Jose M., 4,524,928, Cl. 244-35.00R.
Dorr-Oliver Incorporated: *See*—
Willus, Charles A.; Kosonen, Vaino J.; and Sanchez, Dale R., 4,525,274, Cl. 210-232.000.
Dorschner, Terry A., to Raytheon Company. Enhanced magnetic mirror. 4,525,028, Cl. 350-377.000.
Dove, Georges: *See*—
Giddey, Claude; and Dove, Georges, 4,525,372, Cl. 426-564.000.
Dow Chemical Company, The: *See*—
Adaway, Timothy J.; Fravel, Harold G., Jr.; and Easterly, James P., Jr., 4,525,496, Cl. 523-337.000.
Coleman, William M., III; and Edmondson, Morris S., 4,525,556, Cl. 526-125.000.
Dorman, Linneaus C.; and Meyers, Paul A., 4,525,495, Cl. 523-205.000.
McKinney, Linda M.; and McKinney, Osborne K., 4,525,405, Cl. 428-95.000.
Nelson, Donald L.; and Lamont, Mary H., 4,525,544, Cl. 525-531.000.
Tung, Lu H.; Lo, Grace Y.; and Griggs, Jerald A., 4,525,532, Cl. 525-98.000.
Wessling, Ritchie A.; and Pickelman, Dale M., 4,525,526, Cl. 524-815.000.
Woo, Edmund P.; and Mullins, Michael J., 4,525,577, Cl. 528-327.000.
Dow Corning Corporation: *See*—
Cooper, Ian V., 4,525,279, Cl. 210-728.000.
Cooper, Ian V., 4,525,281, Cl. 210-735.000.
Homan, Gary R.; and Stickles, David L., 4,525,566, Cl. 528-17.000.
Kohl, Charles F., 4,525,470, Cl. 502-167.000.
Dowell, Howard A.: *See*—
Norman, Edward C.; and Dowell, Howard A., 4,525,501, Cl. 524-28.000.
Downen, Jim L.: *See*—
Sutliff, Wayne N., 4,524,838, Cl. 175-297.000.
Drake, Daniel. Cart anti-theft device. 4,524,985, Cl. 280-33.99C.
Dresser Industries, Inc.: *See*—
Patel, Arvind D., 4,525,562, Cl. 526-271.000.
Drexel, Charles F.; and Blair, Richard F., to Tylan Corporation. Adjustable laminar flow bypass. 4,524,616, Cl. 73-203.000.
Drexler Technology Corporation: *See*—
Haddock, Richard, 4,524,925, Cl. 242-197.000.
Dria, Dennis E.: *See*—
Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., 4,525,471, Cl. 502-209.000.
D'Silva, Themistocles D. J.: *See*—
Bushey, Dean F.; and D'Silva, Themistocles D. J., 4,525,357, Cl. 514-258.000.
Dubiel, Oswald; Hirtsiefer, Karl-Richard; and Wagner, Paul-Heinz, to Paul-Heinz Wagner. Power wrench. 4,524,651, Cl. 81-57.390.
DuBois, Dale R.: *See*—
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,524,719, Cl. 118-719.000.
Duffaut, Francois, to Imphy S.A. Iron-based alloys for welded structural elements, method of manufacturing such elements and structures built therefrom. 4,525,431, Cl. 428-638.000.
Duke, Jerry R.: *See*—
Wenzel, Kenneth G.; and Duke, Jerry R., 4,524,652, Cl. 81-63.000.
Duncan, Seymour. Electromagnetic pickup for a stringed musical instrument having ferromagnetic strings and method. 4,524,667, Cl. 84-1.150.
Duni Bila AB: *See*—
Svensson, Sven A. T., 4,524,474, Cl. 5-484.000.
Dunn, James M.; and Haas, Ronald T., to Verex Laboratories, Inc. Constant order release, solid dosage indomethacin formulation and method of treating arthritis and other inflammatory conditions. 4,525,345, Cl. 424-22.000.
Dunner, Max, to Lista AG. Locking apparatus for drawers and the like. 4,525,012, Cl. 312-222.000.
Du Pont de Nemours, E. I., and Company: *See*—
Baker, Melvin C., 4,525,580, Cl. 528-490.000.
DenHartog, Herman C.; and Walus, Aloysius N., 4,525,521, Cl. 524-517.000.
Feiring, Andrew E., 4,525,539, Cl. 525-326.300.
Mack, Mark P.; and Shannon, Mark L., 4,525,468, Cl. 502-104.000.
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,525,322, Cl. 264-531.000.
Duracell Inc.: *See*—
Barnette, Luverne H.; and Liang, Charles C., 4,525,440, Cl. 429-191.000.
Durenec, Peter; and Lowe, Clifford E., to United States of America, Army. Detachably connectable sight assembly for a small defense weapon. 4,524,675, Cl. 89-41.030.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., to Feldmuhle Aktiengesellschaft. Cylinder head of a piston engine. 4,524,732, Cl. 123-193.00H.
Dworsky, Lawrence N., to Motorola, Inc. Dual frequency, dual mode quartz resonator. 4,525,647, Cl. 310-361.000.
Dyatlova, Nina M.: *See*—
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk,

Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.
Dynamit Nobel AG: *See—*
Theis, Christoph; and Prange, Uwe, 4,525,310, Cl. 260-465.600.
Dytjuk, Leonid T.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.
E. R. Squibb & Sons, Inc.: *See—*
Das, Jagabandhu; and Haslanger, Martin F., 4,525,479, Cl. 514-469.000.
Easterly, James P., Jr.: *See—*
Adaway, Timothy J.; Fravel, Harold G., Jr.; and Easterly, James P., Jr., 4,525,496, Cl. 523-337.000.
Eastman Kodak Company: *See—*
Affolter, Peter, 4,525,829, Cl. 369-284.000.
Detty, Michael R.; and Perlstein, Jerome H., 4,525,443, Cl. 430-83.000.
Guardino, Robert F.; and Belly, Robert T., 4,525,453, Cl. 435-34.000.
Losee, David L., 4,525,733, Cl. 357-65.000.
Morris, John C.; and Zannucci, Joseph S., 4,525,504, Cl. 524-99.000.
Schmidt, Robert R., 4,525,551, Cl. 526-116.000.
Eaton Corporation: *See—*
Dennison, William G.; Horr, Kenneth R.; and Kindler, Robert I., 4,525,694, Cl. 335-132.000.
Jones, William H.; and Chambers, Worthy L., 4,525,697, Cl. 337-354.000.
Ebata, Yoshihiro; Tamari, Nobuyuki; Toibana, Yasuo; and Hayami, Ryozo, to Agency of Industrial Science & Technology. Process for metallizing the surface of a ceramic. 4,525,387, Cl. 427-190.000.
Eberling, Ernest W., Jr. Portable gravity assisted lumbar traction device. 4,524,763, Cl. 128-75.000.
Ebert, Karl, to Max Widenmann Armaturenfabrik. Hose coupling. 4,524,997, Cl. 285-74.000.
Ebert, Michael: *See—*
Reick, Franklin G., 4,525,286, Cl. 252-21.000.
Echte, Adolf: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,525,484, Cl. 521-56.000.
Eckberg, Richard P., to General Electric Company. Vinyl gum cure accelerators for condensation-cure silicone. 4,525,391, Cl. 427-391.000.
Eckerson, Richard L. Fishing lure retriever. 4,524,536, Cl. 43-17.200.
Eckert, Alton B.: *See—*
Soderberg, John H.; Eckert, Alton B.; and McFiggans, Robert B., 4,525,785, Cl. 364-464.000.
Eckert, Hans: *See—*
Mangold, Hans; Eckert, Hans; and Schonborn, Jurgen, 4,525,746, Cl. 358-254.000.
Economopoulos. Peter C.: *See—*
Still, David W.; and Economopoulos, Peter C., 4,525,714, Cl. 340-825.830.
Economou, John E.: *See—*
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Edahiro, Takao: *See—*
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,525,027, Cl. 350-96.300.
Edgerton, Robert F., to Energy Conversion Devices, Inc. Optical methods for controlling layer thickness. 4,525,376, Cl. 427-10.000.
Edme , Jacques; and Deffontaine, Etienne, to Centre Technique Industriel Dit: Insttiut Textile de France; and Establissement Public Dit: Agence Nationale de Valorisation de la Recherche (Anvar). System for detecting the presence of a yarn on a continuous spinning frame. 4,525,705, Cl. 340-677.000.
Edmondson, Morris S.: *See—*
Coleman, William M., III; and Edmondson, Morris S., 4,525,556, Cl. 526-125.000.
Ehlers, Raymond G.: *See—*
Ghaem-Maghami, Sanjar; and Ehlers, Raymond G., 4,525,745, Cl. 358-237.000.
Ehlers, Thomas G. Wind powered grain drying apparatus. 4,524,528, Cl. 34-102.000.
Ehnot, Donald J.: *See—*
Klee, David J.; and Ehnot, Donald J., 4,524,548, Cl. 51-322.000.
Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Kohl, Wilhelm, to Schering Aktiengesellschaft. Fertilizer. 4,525,197, Cl. 71-11.000.
Eichelberger, Leo: *See—*
Fleischer, Wolfgang; Eichelberger, Leo; and Endress, Georg, 4,524,808, Cl. 138-103.000.
Einfeld, Klaus: *See—*
Spilker, Harry; and Einfeld, Klaus, 4,525,324, Cl. 376-272.000.
Eisbein, Jurgen, to Develop Dr. Eisbein GmbH & Co. Paper holder for a photocopying machine. 4,525,063, Cl. 355-72.000.
Ekholm, Jan: *See—*
Bengtsson, Bengt L.; Palmlin, Peter; and Ekholm, Jan, 4,525,368, Cl. 426-438.000.
El-Chem Corporation: *See—*
Church, Peter K., 4,525,425, Cl. 428-428.000.
Eldumiati, Ismail I.; and Maul, Michael K., to Bell Telephone Laboratories, Incorporated. Arithmetic logic unit arranged for manipulating bits. 4,525,776, Cl. 364-200.000.
Electric Power Research Institute, Inc.: *See—*
Johnson, Benjamin M., 4,524,728, Cl. 122-459.000.
Tassicker, Owen J., 4,525,184, Cl. 55-302.000.
Electro-Voice, Incorporated: *See—*
Frye, Kent, 4,525,604, Cl. 179-115.50H.
Electrochem International, Inc.: *See—*
Horn, Richard E.; and Rodeheaver, Bradley D., 4,525,259, Cl. 204-182.400.
Elesh, James N., to Flexi-Mat Corporation. Nylon or polyester treated fabric for bedding. 4,525,409, Cl. 428-193.000.
Elf France: *See—*
Gourlia, Jean-Paul; Jacob, Philippe; and Jamen, Robert, 4,525,244, Cl. 203-26.000.
Eli Lilly and Company: *See—*
Chou, Ta-Sen; and Heath, Perry C., 4,525,587, Cl. 544-025.000.
Gallick-Whitaker, Nancy G., 4,525,584, Cl. 536-24.000.
Hall, David A.; and Spitzer, Wayne A., 4,525,304, Cl. 260-245.400.
Elias, Moenes L.; and Burger, Walter L., to Plastic Specialties and Technologies, Inc. Dissolution of metals utilizing tungsten. 4,525,240, Cl. 156-659.100.
Elion, Glenn R., to Aetna Telecommunications Laboratories. Optical fiber protection by powder filled coatings. 4,525,026, Cl. 350-96.230.
Elliott, James J. Ornamental fixture for suspending potted plants. 4,524,542, Cl. 47-67.000.
Elliott, Olin S. Carding apparatus and method. 4,524,492, Cl. 19-107.000.
Elmec Corporation: *See—*
Kameya, Kazuo, 4,525,691, Cl. 333-139.000.
Elms, Robert T.: *See—*
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., 4,525,650, Cl. 315-226.000.
Eltech Systems Corporation: *See—*
Miller, Thomas M.; Schraff, Raymond J.; and Labas, Nicholas, 4,524,702, Cl. 110-173.00A.
Emhart Industries, Inc.: *See—*
Fenton, Frank A., 4,525,191, Cl. 65-83.000.
Foster, Thomas V., 4,525,195, Cl. 65-260.000.
EMI Limited: *See—*
Sansom, David J., 4,525,671, Cl. 324-252.000.
Encon Products, Inc.: *See—*
Simpson, Harold G., 4,524,554, Cl. 52-693.000.
Encon Systems, Ltd.: *See—*
Schmidt, Donald R., 4,524,733, Cl. 123-196.00A.
Endress, Georg: *See—*
Fleischer, Wolfgang; Eichelberger, Leo; and Endress, Georg, 4,524,808, Cl. 138-103.000.
Energy Conversion Devices, Inc.: *See—*
Edgerton, Robert F., 4,525,376, Cl. 427-10.000.
Keem, John E.; and Marshall, Gerald F., 4,525,853, Cl. 378-84.000.
Engdahl, Roger, to Proform, Inc. Opening cover for railroad cars. 4,524,700, Cl. 105-377.000.
Engel, Hartmut: *See—*
Hesse, Kurt; and Engel, Hartmut, 4,525,773, Cl. 362-413.000.
Engel, Joseph C.: *See—*
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., 4,525,650, Cl. 315-226.000.
Engelhard Corporation: *See—*
Kostansek, Edward C., 4,525,518, Cl. 524-447.000.
Enoki, Takashi; Nakamura, Hiroaki; and Nakashima, Fujio, to Hitachi, Ltd. Function selecting method and system for an audio/video recording and reproducing system. 4,525,820, Cl. 369-2.000.
Enokido, Nobuo: *See—*
Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, 4,525,554, Cl. 526-124.000.
Enoxy Chimica S.p.A.: *See—*
Carbonaro, Antonio; and Ferraro, Domenico, 4,525,549, Cl. 526-92.000.
Enterra Corporation: *See—*
Norman, Edward C.; and Dowell, Howard A., 4,525,501, Cl. 524-28.000.
Epson Corporation: *See—*
Akazawa, Hiroyuki, 4,525,085, Cl. 400-59.000.
Koto, Haruhiko, 4,525,728, Cl. 346-140.00R.
Erickson, James R.: *See—*
Abbey, Kirk J.; and Erickson, James R., 4,525,260, Cl. 204-181.700.
Ericson, Kurt S. B.; and Van Olst, Gijsbrecht H. J., to Ericson, Kurt Sture Birger. Hydraulic device for the drainage of waste water. 4,524,795, Cl. 137-216.200.
Ericson, Kurt Sture Birger: *See—*
Ericson, Kurt S. B.; and Van Olst, Gijsbrecht H. J., 4,524,795, Cl. 137-216.200.
Eriksson, Sture, to Armerad Betong Vagforbattringar Aktiebolag. Method of dewatering a cake of biomass. 4,525,172, Cl. 44-32.000.
Erkes, Joseph W.: *See—*
Mannava, Seetha R.; and Erkes, Joseph W., 4,525,068, Cl. 356-35.500.
Erzmoneit, Horst. Billiard apparatus having sensors in lieu of pockets. 4,524,969, Cl. 273-3.00R.
Esaki, Hiroshi: *See—*
Kohashi, Tadao; Irie, Hiroyuki; Ide, Susumu; and Esaki, Hiroshi, 4,525,727, Cl. 346-140.00R.

Essex Specialty Products, Inc.: *See*—
Kirby, Michael D.; and Mazzeo, Michael P., 4,525,511, Cl. 524-158.000.

Etablissement Public Dit: Agence Nationale de Valorisation de la Recherche (Anvar): *See*—
Edme , Jacques; and Deffontaine, Etienne, 4,525,705, Cl. 340-677.000.

Estabrook, Lawrence E.: *See*—
Koog, Wolfgang; and Estabrook, Lawrence E., 4,525,176, Cl. 48-197.00R.

Estes, Morton B.: *See*—
Sunnen, Robert M.; and Estes, Morton B., 4,524,549, Cl. 51-347.000.

Etablissements Tourtellier S.A.: *See*—
Tourtellier, Jean-Louis; and Schoen, Roger, 4,524,698, Cl. 104-107.000.

Etat Francais: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Ethicon Inc.: *See*—
McGregor, Walter; and Troutman, Richard C., 4,524,771, Cl. 128-339.000.

Evans, Edwin R.: *See*—
Bush, Richard B.; and Evans, Edwin R., 4,525,528, Cl. 524-860.000.

Evans Pipeline Equipment Company: *See*—
Slavens, Clyde M., 4,525,616, Cl. 219-60.00R.

Evans, Robert D.: *See*—
Gullotti, Damian V.; Winter, Joseph; Young, Kenneth P.; and Evans, Robert D., 4,524,820, Cl. 164-476.000.

Ewald, Ole, to Damas Maskinfabrik A/S. Screening apparatus for grains, seeds or the like materials or granules. 4,525,271, Cl. 209-303.000.

Ewing, John J.: *See*—
Fecik, Michael T.; Ewing, John J.; and Mates, Edward I., 4,525,196, Cl. 65-287.000.

Exxon Research & Engineering Co.: *See*—
Huff, Terrence; and Poirot, Eugene E., 4,525,467, Cl. 502-121.000.
Sartori, Guido; and Thaler, Warren A., 4,525,294, Cl. 252-182.000.
Soled, Stuart L.; Wold, Aaron; and Kershaw, Robert, 4,525,206, Cl. 75-0.5BA.
Turner, S. Richard; Walker, Thad O.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,525,522, Cl. 524-547.000.
Yablonovitch, Eli, 4,525,593, Cl. 136-255.000.

Eydelman, Grigory. Adaptive control system. 4,525,775, Cl. 364-148.000.

F. F. Seeley Nominees Pty. Ltd.: *See*—
Mortimer, John K., 4,524,902, Cl. 229-52.00A.

Fabriques De Tabac Reunies S.A.: *See*—
Gaisch, Helmut; and Schultheiss, Dieter, 4,524,786, Cl. 131-308.000.

Facet Enterprises, Inc.: *See*—
Digby, James J., 4,524,629, Cl. 74-7.00R.
Miller, Donald L., 4,524,854, Cl. 192-84.00C.

Fahrmbacher-Lutz, Ludwig; and Seidler, Klaus, to Ludwig Fahrmbacher-Lutz. Method for chemical removal of oxide layers from objects of metal. 4,525,250, Cl. 204-58.500.

Fairchild Industries, Inc.: *See*—
Renshaw, Theodore A., 4,524,898, Cl. 228-1.100.

Falconieri, Remo, to C. Olivetti & C., S.p.A. Document feed-in device. 4,525,089, Cl. 400-639.100.

Falkenberg, Werner: *See*—
Horak, Otto; Falkenberg, Werner; Muders, Rolf; and Beinert, Werner, 4,525,283, Cl. 210-762.000.

Fanget, Bernard J. C.: *See*—
Montagnon, Bernard J.; and Fanget, Bernard J. C., 4,525,349, Cl. 424-89.000.

Fanti, Hansruedi, to Matra AG. Foam material body for a pad, particularly a mattress. 4,524,473, Cl. 5-481.000.

Farazandeh, Edward A.: *See*—
Heaston, Gaylord E.; and Farazandeh, Edward A., 4,524,547, Cl. 51-165.770.

Faulhaber, Gerhard: *See*—
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Raubenheimer, Hans-Jurgen, 4,525,581, Cl. 528-503.000.

Fazekas, Carl F., to Panavision, Inc. Camera for three-dimensional movies. 4,525,045, Cl. 352-57.000.

Fecik, Michael T.; Ewing, John J.; and Mates, Edward I., to PPG Industries, Inc. Glass sheet handling devices. 4,525,196, Cl. 65-287.000.

Feder, Alvin: *See*—
Rapps, Gary M.; and Feder, Alvin, 4,524,497, Cl. 29-25.350.

Federal Paper Board Company, Inc.: *See*—
Frost, Arthur W., III, 4,525,278, Cl. 210-638.000.

Fehrer, Ernst. Apparatus for making a yarn from a roving. 4,524,580, Cl. 57-401.000.

Feiring, Andrew E., to Du Pont de Nemours, E. I., and Company. Vulcanizable nitrile-containing perfluoroelastomer. 4,525,539, Cl. 525-326.300.

Feldman, Paul L.: *See*—
Gleason, Robert J.; and Feldman, Paul L., 4,525,142, Cl. 423-235.000.

Feldmuhle Aktiengesellschaft: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.

Feldsted, Robert J. C. Barge having a pneumatic loading and unloading system. 4,525,107, Cl. 406-25.000.

Felix, Raymond A., to Stauffer Chemical Company. O,O-Dialkyl-N-(benzyl or t-butyl)-N-cyanomethyl aminomethylphosphonates. 4,525,311, Cl. 260-940.000.

Fenn, Ronald S.: *See*—
Wiegers, Wilhelmus J.; Fenn, Ronald S.; Boden, Richard M.; and Schreiber, William L., 4,524,783, Cl. 131-276.000.

Fenne, Ivor, to Lucas Industries public limited company. Delivery valves. 4,524,799, Cl. 137-516.270.

Fenton, Frank A., to Emhart Industries, Inc. Method of cooling a glass ware mould. 4,525,191, Cl. 65-83.000.

Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., to Gosudarstvenny Nauchno-Issledovatelsky I Proektny Institut Po Obogascheniju Rud Tsvetnykh Metallov "Kazmekhanobr". Process and apparatus for purifying effluents and liquors. 4,525,254, Cl. 204-150.000.

Ferguson, Michael H.: *See*—
Barnich, Richard G.; Ferguson, Michael H.; and McGregor, Charles K., 4,525,601, Cl. 179-7.0MM.

Ferraro, Domenico: *See*—
Carbonaro, Antonio; and Ferraro, Domenico, 4,525,549, Cl. 526-92.000.

Feusi, Markus; Huber, Josef; Oswald, Heinz; and Pfyffer, Peter, to Rieter Machine Works, Ltd. Filament winding machine. 4,524,918, Cl. 242-18.00A.

Fiberglas Canada Inc.: *See*—
Rastall, Mary H.; Ng, Norman H.; and MacPherson, Edwin J., 4,525,492, Cl. 521-181.000.

Field, Thomas R.; Hughes, Frank M.; Shakib, Iraj D.; and Vitek, Edward J., Jr., to International Business Machines Corporation. Solenoid actuated pivotal printer hammer mechanism. 4,525,086, Cl. 400-144.200.

Fields, Robert J. Perforated reinforcing strip for use with continuous forms. 4,525,399, Cl. 428-43.000.

Filderman, Rene ; and Pilache, Michel, to Valeo. Belt and pulley transmission. 4,525,159, Cl. 474-201.000.

Fingerle, Dieter: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.

Finike Italiana Marposs S.p.A.: *See*—
Golinelli, Guido; and Dall'Aglio, Carlo, 4,524,523, Cl. 33-143.00L.

Fink, Herbert: *See*—
Dinklage, Horst; Fink, Herbert; and Wolf, Hans-Peter, 4,525,418, Cl. 428-264.000.

Finkler, Saul M., to Centennial Jewelers, Inc. Diamond gauge with three-dimensional stone simulant. 4,524,525, Cl. 33-178.00B.

Finn Corporation: *See*—
Keyes, Richard E.; and Dirksing, John W., 4,524,916, Cl. 241-101.00A.

Firmenich SA: *See*—
Schulte-Elte, Karl H.; and Muller, Bernard L., 4,525,298, Cl. 252-522.00R.

Fischell, Robert E.; Newman, Arnold L.; Riblet, Henry B.; and Powell, William R., to John Hopkins University, The. Apparatus for inhibiting self-injurious behavior (SIB) in patients. 4,524,773, Cl. 128-419.00S.

Fischell, Robert E., to Johns Hopkins University, The. Fluid handling system for medication infusion system. 4,525,165, Cl. 604-131.000.

Fitzgerald, J. Vincent; Matusik, Frank J.; and Nelson, Donald W., to National Metal and Refining Company, Ltd. In-line vibratory viscometer-densitometer. 4,524,610, Cl. 73-54.000.

Fitzgerald, William V., to RCA Corporation. Television receiver power supply regulation responding to beam current changes. 4,525,739, Cl. 358-190.000.

Fives-Cail Babcock: *See*—
Pietryka, Joseph, 4,524,818, Cl. 164-448.000.

Flakt AB: *See*—
Bockman, Ole K., 4,525,181, Cl. 55-71.000.

Flanagan, Joseph E.: *See*—
Artz, Glen D.; and Flanagan, Joseph E., 4,525,226, Cl. 149-35.000.

Flassayer, Claude; Le Grives, Bernard; and Simon, Paul R., to Sfernice Societe Francaise de l'Electro-Resistance. Process for manufacturing an electric circuit intended for firing a pyrotechnic device and the circuit thus obtained. 4,525,238, Cl. 156-645.000.

Fleischer, Wolfgang; Eichelberger, Leo; and Endress, Georg, to Siemens Aktiengesellschaft; and Technochemie Kessler & Co. GmbH. Vacuum cleaner hose. 4,524,808, Cl. 138-103.000.

Fleissner, Heinz, to Vepa Aktiengesellschaft. Apparatus for froth processing of lengths of material. 4,524,589, Cl. 68-5.00D.

Fletcher, Mary A., to University of Miami. New purified glycoproteins and use in diagnosing infectious mononucleosis. 4,525,459, Cl. 436-544.000.

Flexi-Mat Corporation: *See*—
Elesh, James N., 4,525,409, Cl. 428-193.000.

Flohr, Wolfgang P.: *See*—
Bourauel, Fritz; Flohr, Wolfgang P.; and Weishaupt, Walter, 4,524,612, Cl. 73-117.300.

Flynn, Richard T.: *See*—
Webster, Marvin K.; Flynn, Richard T.; Porter, Marion G.; and Seminsky, George M., 4,525,777, Cl. 364-200.000.

Fochler, Helmut P.: *See*—
Pate, Harold T.; and Fochler, Helmut P., 4,524,999, Cl. 285-158.000.

Focke & Co.: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,524,658, Cl. 83-152.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Apparatus for producing packaging blanks. 4,524,658, Cl. 83-152.000.
Foggini, Giovanni, to Lear S.n.c. di Foggini & C. Swivel attachment for auto vehicle adjustable sun visors. 4,525,008, Cl. 296-97.00K.
Foley, Mark P.: *See*—
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.
Fookes, Michael J.: *See*—
Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., 4,525,139, Cl. 431-189.000.
Ford Aerospace & Communications Corporation: *See*—
Wagner, Gary L.; and Serrone, Michael J., 4,525,689, Cl. 333-104.000.
Ford Motor Company: *See*—
Hargunani, Ashok B.; and Chou, Clifford C., 4,524,603, Cl. 73-12.000.
Hartsock, Dale L., 4,524,498, Cl. 29-156.4WL.
Hoffman, David W., 4,525,264, Cl. 204-298.000.
Kordomenos, Panagiotis I., 4,525,569, Cl. 528-73.000.
Fore, William M., to Halliburton Company. Well packer. 4,524,825, Cl. 166-139.000.
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., to S.N.E.C.M.A. Apparatus for molding and perforating a FRP sheet. 4,525,135, Cl. 425-290.000.
Formo, Jerome L.; Lasher, Albert C.; and White, Robert W., to O Tray Corporation. Nestable, stackable cutlery. 4,524,512, Cl. 30-147.000.
Forsythe, Alan K.: *See*—
Green, Charles J.; and Forsythe, Alan K., 4,524,951, Cl. 251-327.000.
Foseco Trading A.G.: *See*—
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.
Foster, Thomas V., to Emhart Industries, Inc. Take-out mechanism for a glassware forming machine. 4,525,195, Cl. 65-260.000.
Foust, Robert K. Coffin bed adjusting apparatus. 4,524,472, Cl. 5-62.000.
Fowler, David P., to Frito-Lay, Inc. Apparatus and method for supporting, guiding and temperature-treating a puff extruded food product. 4,525,369, Cl. 426-446.000.
Foyt, Arthur G.; Leonberger, Frederick J.; and Williamson, Richard C., to Massachusetts Institute of Technology. High speed optoelectronic mixer. 4,525,871, Cl. 455-325.000.
Franaszek, Peter A.; and Yarmchuk, Edward J., to International Business Machines Corporation. Magnetic recording head array for longitudinal magnetic printing with staggered head arrangement and clustered wiring. 4,525,724, Cl. 346-74.500.
Frank, Gunther: *See*—
Class, Eberhard; Schweizer, Heiner; and Frank, Gunther, 4,524,843, Cl. 180-179.000.
Frank, Jimmy I.; and Wolfe, John R., III, to Gagemaker, Inc. Gage for measuring diameters. 4,524,524, Cl. 33-147.00M.
Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,524,682, Cl. 99-477.000.
Franz, Herbert: *See*—
Burba, Christian; and Franz, Herbert, 4,525,571, Cl. 528-111.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Muller, Dietmar, 4,525,313, Cl. 264-3.00B.
Fraunhofer-Gesellschaft zur Forderung der angwandten Forschung e.V.: *See*—
Scheicher, Hans; Siegele, Dieter; and Soltesz, Uwe, 4,525,145, Cl. 433-173.000.
Fravel, Harold G., Jr.: *See*—
Adaway, Timothy J.; Fravel, Harold G., Jr.; and Easterly, James P., Jr., 4,525,496, Cl. 523-337.000.
Freeburg, Thomas A., to Motorola, Inc. Zoned data communications system for communicating message signals between portable radios and a host computer. 4,525,861, Cl. 455-33.000.
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., to RCA Corporation. Disc record with tapered groove. 4,525,751, Cl. 358-342.000.
Frieden, Peter: *See*—
Berges, Hanns-Peter; Frieden, Peter; and Leier, Wolfgang, 4,525,129, Cl. 418-84.000.
Friedrich, Michael B.: *See*—
Buck, Robert; Friedrich, Michael B.; Gesthuysen, Hans D.; and Marhofer, Gerd, 4,525,699, Cl. 340-512.000.
Friedrich, Wolfgang: *See*—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Hans, Rudiger, 4,525,082, Cl. 384-138.000.
Friendship, Kenneth F. M.: *See*—
Pocock, John F. E.; Mahajan, Gautam K.; Krishnakumar, Suppayan M.; and Friendship, Kenneth F. M., 4,525,401, Cl. 428-64.000.
Frito-Lay, Inc.: *See*—
Fowler, David P., 4,525,369, Cl. 426-446.000.
Fritsch, Joseph E. High torque infinitely variable epicyclic transmission. 4,524,642, Cl. 74-796.000.
Fritz, Bobby D. Dental attachment. 4,525,144, Cl. 433-118.000.
Frohlich, Sigurd. Piezoelectric-enhanced circuit connection means. 4,525,644, Cl. 310-328.000.
Frontier Electronics, Inc.: *See*—
Cochran, John M., Jr.; and Cleveland, Ronald N., 4,524,839, Cl. 177-45.000.
Fronzoni, Mario A.: *See*—
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,524,957, Cl. 266-252.000.
Frost, Arthur W., III, to Federal Paper Board Company, Inc. Method of treating chemical process water. 4,525,278, Cl. 210-638.000.
Frye, Kent, to Electro-Voice, Incorporated. Horn loudspeaker with convex diaphragm. 4,525,604, Cl. 179-115.50H.
Fuchigami, Shuzo: *See*—
Ishizaki, Keiichi; and Fuchigami, Shuzo, 4,525,392, Cl. 427-420.000.
Fuchs Systems, Inc.: *See*—
Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., 4,525,139, Cl. 431-189.000.
Fuji Photo Film Company, Limited: *See*—
Ishizaki, Keiichi; and Fuchigami, Shuzo, 4,525,392, Cl. 427-420.000.
Nakajima, Junya; Imai, Kiyoshi; and Nakamura, Takashi, 4,525,449, Cl. 430-407.000.
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, 4,525,742, Cl. 358-213.000.
Ohashi, Saichiro, 4,525,050, Cl. 354-195.120.
Ohki, Nobutaka; and Yoshida, Yoshinobu, 4,525,451, Cl. 430-551.000.
Tsunekawa, Yuzo; and Tomizawa, Takashi, 4,524,596, Cl. 72-133.000.
Yokoo, Hirokazu, 4,525,055, Cl. 354-468.000.
Fuji Xerox Co., Ltd.: *See*—
Miyao, Fumio, 4,525,832, Cl. 370-85.000.
Nishimura, Nobuo, 4,525,822, Cl. 369-44.000.
Tan, Yoichi; and Miyao, Fumio, 4,525,837, Cl. 370-85.000.
Fujibayashi, Kazuo; Sugiura, Muneharu; and Tsuji, Sadahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Zoom lens. 4,525,036, Cl. 350-427.000.
Fujiki, Norio: *See*—
Fukuhara, Hiroshige; and Fujiki, Norio, 4,525,870, Cl. 455-297.000.
Fujikogyosho Co., Ltd.: *See*—
Saito, Akihiro, 4,525,617, Cl. 219-83.000.
Fujikura Ltd.: *See*—
Saito, Takashi; Suzuki, Kazumoto; and Naganuma, Yoshihiro, 4,525,432, Cl. 428-653.000.
Fujimura, Hiroshi: *See*—
Ide, Eizo; and Fujimura, Hiroshi, 4,525,619, Cl. 219-124.220.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Sato, Yoshinari, 4,525,478, Cl. 514-350.000.
Fujitsu Limited: *See*—
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,525,434, Cl. 428-674.000.
Sano, Yoshiaki; Tsuchiya, Chikara; and Maida, Osamu, 4,525,637, Cl. 307-350.000.
Toyoda, Kazuhiro; and Ono, Chikai, 4,525,812, Cl. 365-155.000.
Fujiwara, Koji: *See*—
Misawa, Yoshihiko; Seno, Makito; and Fujiwara, Koji, 4,524,860, Cl. 198-740.000.
Fukawa, Isaburo; and Sato, Kazutoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing polyethylene and an ethylene-α-olefin copolymer. 4,525,546, Cl. 526-68.000.
Fukoku Kogyo Co., Ltd.: *See*—
Sato, Hachiro, 4,524,684, Cl. 100-117.000.
Fukuda, Tadaji: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,525,442, Cl. 430-57.000.
Fukuhara, Hiroshige; and Fujiki, Norio, to Nissan Motor Company, Limited. Automotive radio receiver with radio frequency interference elimination circuit. 4,525,870, Cl. 455-297.000.
Fukui, Hisatoshi: *See*—
Maeda, Hirofumi; Nakamura, Kyoichi; and Fukui, Hisatoshi, 4,525,485, Cl. 521-58.000.
Fukui, Hishao: *See*—
Shimizu, Takahiko; Fukui, Hishao; and Kohno, Tadashi, 4,525,092, Cl. 401-265.000.
Fukui, Yukio: *See*—
Sugiyama, Toshio; Suenaga, Hideo; and Fukui, Yukio, 4,525,823, Cl. 369-44.000.
Fuller Company: *See*—
DiBuo, Louis J.; Solt, Paul E.; and Souders, Marvyn L., 4,525,106, Cl. 406-60.000.
Fulton, John D. Collapsible garment hanger. 4,524,890, Cl. 223-94.000.
Funaki, Masahiko: *See*—
Narisawa, Shigeyuki; Funaki, Masahiko; Kojima, Hiroaki; and Kuga, Kazuhiko, 4,525,491, Cl. 521-174.000.
Fundom, Danny L.; and Kirk, William A., to Van Dorn Company. Can end pour spout and pull tab construction. 4,524,879, Cl. 220-273.000.
G-C Dental Industrial Corporation: *See*—
Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, 4,524,824, Cl. 106-35.000.
G.D Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,524,781, Cl. 131-108.000.
Seragnoli, Enzo; and Neri, Armando, 4,524,784, Cl. 131-281.000.
Seragnoli, Enzo; and Neri, Armando, 4,524,785, Cl. 131-281.000.
G & G Sewing Machine Co., Inc.: *See*—
Cusumano, Salvatore V., 4,524,704, Cl. 112-105.000.

Gagemaker, Inc.: *See*—
Frank, Jimmy I.; and Wolfe, John R., III, 4,524,524, Cl. 33-147.00M.
Gaisch, Helmut; and Schulthess, Dieter, to Fabriques De Tabac Reunies S.A. Continuous process for microbial degradation of tobacco constituents containing nitrates. 4,524,786, Cl. 131-308.000.
Galiasso, Roberto: *See*—
Morales, Alfredo; Galiasso, Roberto; and Carrasquel, Angel R., 4,525,472, Cl. 502-323.000.
Galla, Edward A.; and Smoyer, Bruce A., to Air Products and Chemicals, Inc. Shipping flexible polyurethane foam product. 4,525,316, Cl. 264-54.000.
Gallick-Whitaker, Nancy G., to Eli Lilly and Company. 4aR,8aS,9R-5,6-Permissibly substituted-9-hydroxy-octahydro-1H(and 2H) pyrazolo[3,4-g]quinoline. 4,525,584, Cl. 536-24.000.
Gallup, Jeffrey M.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Gallup, Jeffrey M., 4,525,804, Cl. 364-900.000.
Gallup, Michael G.: *See*—
Smith, Philip S.; and Gallup, Michael G., 4,525,851, Cl. 377-110.000.
Game Time, Inc.: *See*—
Shannon, William H.; and Sutton, Wesley D., Jr., 4,524,966, Cl. 272-85.000.
Garcia, Juan R. Cross. 4,525,821, Cl. 369-31.000.
Garcia, Rodrigo A.; and Martinovich, Robert J. Halogenated organic peroxides in flame retardant ethylene polymer compositions. 4,525,516, Cl. 524-380.000.
Gard Corporation: *See*—
Jones, Larry J., 4,525,219, Cl. 134-1.000.
Garner, Ronald S., Sr. Tack system. 4,525,115, Cl. 411-457.000.
Garwin, Leo. Method for producing isotopically enriched helium-4 and use of same as nuclear reactor coolant. 4,525,186, Cl. 62-22.000.
Gas Research Institute: *See*—
DeWerth, Douglas W.; and Sheridan, Roger D., 4,525,141, Cl. 431-347.000.
Gaudiana, Russell A.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,525,413, Cl. 428-212.000.
Gavrin, Edward S.: *See*—
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.
Gebhard, David F., to Grumman Aerospace Corporation. Short take off jump mode for airplane landing gear struts. 4,524,929, Cl. 244-63.000.
Gebruder Schmidt GmbH & Co. KG: *See*—
Schmidt, Karl W., 4,525,079, Cl. 368-276.000.
Gehrman, Sybil H.; and Porubcan, Randolph S., to Chr. Hansen's Laboratory, Inc. Liquid adherent disinfectant compositions for topical application and method of preparation. 4,525,351, Cl. 424-95.000.
Geiges, Albert F., Jr. Blooming plant implant with message holder. 4,524,541, Cl. 47-58.000.
Geisen, Ingeborg: *See*—
Herold, Julius; and Geisen, Ingeborg, 4,525,234, Cl. 156-332.000.
General Computer Corporation: *See*—
Curran, Kevin G.; Golson, Steven E.; and Rode, Christian S., 4,525,599, Cl. 178-22.080.
General Dynamics Corporation/Convair Div.: *See*—
Hujsak, Edward J., 4,524,552, Cl. 52-108.000.
General Electric Company: *See*—
Ahlgren, Frederic F., 4,525,651, Cl. 315-240.000.
Anthony, Blair T., 4,525,426, Cl. 428-447.000.
Bellino, Joseph P., 4,525,703, Cl. 340-628.000.
Bush, Richard B.; and Evans, Edwin R., 4,525,528, Cl. 524-860.000.
Campbell, John R.; and Williams, Robert E., Jr., 4,525,567, Cl. 528-27.000.
Cline, Harvey E.; Holik, Andrew S.; and Lorensen, William E., 4,525,858, Cl. 382-1.000.
Cushing, Donald S., 4,525,608, Cl. 200-38.00R.
DiBianca, Frank A.; Georges, Jean-Pierre J.; Cusano, Dominic A.; and Greskovich, Charles D., 4,525,628, Cl. 250-367.000.
Eckberg, Richard P., 4,525,391, Cl. 427-391.000.
Ghaem-Maghami, Sanjar; and Ehlers, Raymond G., 4,525,745, Cl. 358-237.000.
Gigl, Paul D., 4,525,179, Cl. 51-309.000.
Hamerla, Donald R., 4,525,800, Cl. 364-900.000.
Hardy, Robert M.; and Premerlani, William J., 4,525,763, Cl. 361-24.000.
Hetzel, Frederick; and McCracken, William G., Jr., 4,525,230, Cl. 156-179.000.
Lee, Gim F., Jr., 4,525,508, Cl. 524-140.000.
Mannava, Seetha R.; and Erkes, Joseph W., 4,525,068, Cl. 356-35.500.
Mears, David F., 4,525,865, Cl. 455-186.000.
Pedersen, James R., 4,525,083, Cl. 384-278.000.
Stackhouse, Bill L., 4,525,793, Cl. 364-513.500.
Surprenant, Richard P., 4,525,400, Cl. 428-54.000.
Traver, Frank J., 4,525,502, Cl. 524-96.000.
Wei, Chung H., 4,525,545, Cl. 526-65.000.
General Motors Corporation: *See*—
Sharma, Ram A., 4,525,212, Cl. 75-68.00R.
General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,525,718, Cl. 343-702.000.
Imazeki, Kazuyoshi; and Wani, Hasashi, 4,525,738, Cl. 358-181.000.
General Scanning Inc.: *See*—
Montagu, Jean I.; and Pelsue, Kurt A., 4,525,030, Cl. 350-255.000.
General Signal Corporation: *See*—
Bachle, Walter W., 4,525,000, Cl. 285-177.000.
Genetay, Michel; and Dangers, Gerard, to Societe Anonyme des Produits Ceramiques de Touraine. Process for converting a ceramic toilet commode intended to be supplied with an independent water supply pipe into a toilet commode adapted to be supplied with water by an associated tank. 4,524,500, Cl. 29-157.00R.
Genetics Institute, Inc.: *See*—
Rozzell, J. David, 4,525,454, Cl. 435-106.000.
Gentry, Robert R .: *See*—
Atkins, Kenneth E.; and Gentry, Robert R ., 4,525,498, Cl. 523-511.000.
Georges, Jean-Pierre J.: *See*—
DiBianca, Frank A.; Georges, Jean-Pierre J.; Cusano, Dominic A.; and Greskovich, Charles D., 4,525,628, Cl. 250-367.000.
Gerber, Bego: *See*—
Jones, Wendy; and Gerber, Bego, 4,525,452, Cl. 435-7.000.
Gerber Garment Technology, Inc.: *See*—
Leblond, Claude W., 4,524,894, Cl. 225-2.000.
Gering, Julie. Tire breaker apparatus. 4,524,813, Cl. 157-1.170.
Gersbach, Klaus: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.
Bocker, Jurgen; Gersbach, Klaus; Bethmann, Karl W.; and Glotz, Gerhard, 4,524,697, Cl. 102-517.000.
Gery, Alan R. Three-dimensional fiber optic display. 4,525,711, Cl. 340-815.310.
Gesthuysen, Hans D.: *See*—
Buck, Robert; Friedrich, Michael B.; Gesthuysen, Hans D.; and Marhofer, Gerd, 4,525,699, Cl. 340-512.000.
GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H.: *See*—
Blaimschein, Gottfried; and Marzy, Otto, 4,525,112, Cl. 409-199.000.
Ghaem-Maghami, Sanjar; and Ehlers, Raymond G., to General Electric Company. Temperature compensation for TV projection lens and CRT assembly. 4,525,745, Cl. 358-237.000.
Ghosh, Chuni L., to International Telephone and Telegraph Corporation. Method of fabricating sub-half-micron-size gates on semiconductor substrates. 4,525,448, Cl. 430-314.000.
Giannotti, Hugo V. Apparatus for separating and re-circulating oversize fuel particles in spark-ignition engines. 4,524,748, Cl. 123-591.000.
Giddey, Claude; and Dove, Georges, to Battelle Memorial Institute. Light condiment having a mustard base and a process for its preparation. 4,525,372, Cl. 426-564.000.
Giebmanns, Karl-Heinz, to ITM International Tool Machines Inc. Grinding machine. 4,524,545, Cl. 51-99.000.
Gigl, Paul D., to General Electric Company. Process for making diamond and cubic boron nitride compacts. 4,525,179, Cl. 51-309.000.
Gilbert, Lawrence A.: *See*—
Cushman, Mark E.; and Gilbert, Lawrence A., 4,525,292, Cl. 252-102.000.
Gillberg, James E., to RCA Corporation. Transient signal suppression circuit. 4,525,635, Cl. 307-247.00R.
Gillen, Gerard J. Timber pile connection system. 4,525,102, Cl. 405-232.000.
Gilliams, Yvan K.: *See*—
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., 4,525,446, Cl. 430-117.000.
Gilvydis, Jaunutis B., to United States of America, Army. Military vehicles. 4,524,674, Cl. 89-36.00H.
Giovagnoli, Paul S., to Master Pitching Machine, Inc. Spring-type ball pitching machine. 4,524,749, Cl. 124-7.000.
Girmes Vertriebsgesellschaft fur Industrietextilien mbH: *See*—
Hynek, Bernd; Valk, Giselher; and Treptau, Gerhard, 4,525,403, Cl. 428-87.000.
Girrell, Carol A.: *See*—
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,524,957, Cl. 266-252.000.
Giusti, Raolo B., to T. Giusti & Son Ltd. Rotary mixing apparatus. 4,525,072, Cl. 366-168.000.
Glantschnig, Josef, to Zimmer, Johannes. Wiper assembly for flat-screen printer. 4,524,688, Cl. 101-123.000.
Glassman, Jacob A. Surgical drapes. 4,524,767, Cl. 128-132.00D.
Glasstech, Inc.: *See*—
McMaster, Ronald A.; and Nitschke, John S., 4,525,193, Cl. 65-114.000.
Glaze, John W., Jr., to Intech Corporation. Hosiery processing method. 4,524,889, Cl. 223-76.000.
Gleason, Robert J.; and Feldman, Paul L., to Research-Cottrell, Inc. Process for treating flue gas with alkali injection and electron beam. 4,525,142, Cl. 423-235.000.
Gleason Works, The: *See*—
Krenzer, Theodore J., 4,525,108, Cl. 407-22.000.
Glotz, Gerhard: *See*—
Bocker, Jurgen; Gersbach, Klaus; Bethmann, Karl W.; and Glotz, Gerhard, 4,524,697, Cl. 102-517.000.
Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, to Kienzle Apparate GmbH. Electropneumatic servo valve for controlling a volume current and pressure, respectively. 4,524,804, Cl. 137-625.640.

Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, to Arbed S.A. Apparatus for closing the discharge aperture of a metallurgical vessel. 4,524,958, Cl. 266-272.000.
Goetzinger, John R. High pressure butterfly valve with floating disk valve member. 4,524,949, Cl. 251-163.000.
Gofuku, Yoshihiro: *See*—
Sawano, Susumu; Gofuku, Yoshihiro; Hashimoto, Junji; and Ando, Takayuki, 4,524,851, Cl. 188-134.000.
Goldberg, Edward M.; and Bazell, Seymour. Body fluid suction device. 4,525,167, Cl. 604-135.000.
Golden, Michael D., to Western Design Corporation. Gun powered ammunition magazine. 4,524,673, Cl. 89-33.020.
Golinelli, Guido; and Dall'Aglio, Carlo, to Finike Italiana Marposs S.p.A. Probe for checking linear dimensions of mechanical pieces. 4,524,523, Cl. 33-143.00L.
Golson, Steven E.: *See*—
Curran, Kevin G.; Golson, Steven E.; and Rode, Christian S., 4,525,599, Cl. 178-22.080.
Gonso, William E., Jr.: *See*—
Pelletier, Charles A.; Gonso, William E., Jr.; Cameron, Douglas S.; and Leonard, Patrick R., 4,524,607, Cl. 73-40.50R.
Goodman, James A., to Prototype Equipment Company. Case top folder and flap supporter. 4,524,560, Cl. 53-374.000.
Goodyear Tire & Rubber Company, The: *See*—
Tung, William C. T.; and Deisz, George A., 4,525,524, Cl. 524-601.000.
Goossens, Jan B. R., to Machinefabriek G.J. Nijhuis B.V. Apparatus for the automatic stunning of slaughter cattle. 4,524,487, Cl. 17-1.00E.
Gordon, Roy G. Reactor for continuous coating of glass. 4,524,718, Cl. 118-718.000.
Goschin, Hans: *See*—
Robra, Joerg; and Goschin, Hans, 4,525,602, Cl. 179-16.00F.
Gossard, Arthur C.: *See*—
Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., 4,525,687, Cl. 332-7.510.
Gosudarstvenny Nauchno-Issledovatelsky I Proektny Institut Po Obogascheniju Rud Tsvetnykh Metallov "Kazmekhanobr": *See*—
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.
Gotoh, Hajime: *See*—
Inoue, Masao; Suzuki, Shingo; and Gotoh, Hajime, 4,525,029, Cl. 350-128.000.
Gotoh, Yasuhiro: *See*—
Nakase, Hiromi; Gotoh, Yasuhiro; and Ozawa, Kuniichi, 4,525,657, Cl. 318-254.000.
Gotte, Elmar; and Schulte, Heinrich, to Klockner-Becorit GmbH. Rail assembly for underground coal-getting machines. 4,524,859, Cl. 198-735.000.
Gottlieb, Robert K.; and Piotroski, Peter N., to Pitney Bowes Inc. Scanner interface circuit for universal multi-station document inserter. 4,525,788, Cl. 364-478.000.
Gourlia, Jean-Paul; Jacob, Philippe; and Jamen, Robert, to Elf France. Vapor recompression reboiling process. 4,525,244, Cl. 203-26.000.
Graham, John W., to Swiss-Tex, Incorporated. Extension handle having cooperating male and female locking sleeves. 4,524,484, Cl. 16-115.000.
Graphic Arts Technical Innovators, Inc.: *See*—
Miller, Curtis B., 4,524,691, Cl. 101-232.000.
Grass Valley Group, Inc., The: *See*—
Dayton, Birney D.; and Leavitt, Dale L., 4,525,836, Cl. 370-67.000.
Rorden, William L., 4,525,677, Cl. 330-258.000.
Gray, Randall C., to International Business Machines Corporation. Zener referenced threshold detector with hysteresis. 4,525,638, Cl. 307-350.000.
GreCon Greten GmbH & Co. KG: *See*—
Greten, Ernst, 4,525,315, Cl. 264-40.400.
Green, Charles J.; and Forsythe, Alan K., to GT Development Corporation. Center-position biased slide valve. 4,524,951, Cl. 251-327.000.
Green, Jasper L.; and Hackett, Steven B., to Weldtec, Inc. Connecting clamp for builder's scaffolding. 4,525,096, Cl. 403-49.000.
Greene, Robert T.: *See*—
Bremer, Gordon; Betts, William L.; and Greene, Robert T., 4,525,846, Cl. 375-39.000.
Greenway, Frank L., III; and Bray, George A. Treatment for selective weight control. 4,525,359, Cl. 514-653.000.
Greenway, Peter R. Spur equipped boot. 4,524,530, Cl. 36-113.000.
Greenwood, Christopher J., to Leyland Vehicles Limited. Continuously-variable ratio-transmission. 4,524,641, Cl. 74-691.000.
Greer, Bradley G., to A & E Systems, Inc. Brake for awning assembly. 4,524,791, Cl. 135-89.000.
Grenell, David J. Toilet lid lock mechanism. 4,524,470, Cl. 4-253.000.
Grenz, Hans J.: *See*—
Knischka, Paul O.; and Grenz, Hans J., 4,525,171, Cl. 23-300.000.
Greskovich, Charles D.: *See*—
DiBianca, Frank A.; Georges, Jean-Pierre J.; Cusano, Dominic A.; and Greskovich, Charles D., 4,525,628, Cl. 250-367.000.
Gressette, Tatum W., Jr. Rotary mixing apparatus. 4,525,070, Cl. 366-18.000.
Greten, Ernst, to GreCon Greten GmbH & Co. KG. Method of correcting irregularities in the built-up of a mat during the manufacture of particleboard. 4,525,315, Cl. 264-40.400.
Grier, Jesse G.; and Hodges, Jimmie R. Chromate ion removal from aqueous solutions. 4,525,483, Cl. 521-28.000.
Griesshammer, Rudolf; and Peterat, Michael, to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe m.b.H. Process for removing impurities from silicon fragments. 4,525,336, Cl. 423-348.000.
Griffith, Louis E., to Power Access Corporation. Automatic wire cutting machine. 4,524,657, Cl. 83-69.000.
Griffith, Richard A.: *See*—
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., 4,524,796, Cl. 137-240.000.
Griggs, Jerald A.: *See*—
Tung, Lu H.; Lo, Grace Y.; and Griggs, Jerald A., 4,525,532, Cl. 525-98.000.
Grimes, John R.: *See*—
Grimes, Philip M.; and Grimes, John R., 4,525,177, Cl. 51-295.000.
Grimes, Philip M.; and Grimes, John R. Method of making coated abrasive disc. 4,525,177, Cl. 51-295.000.
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., to TRW Inc. Method of fabricating an aircraft propeller assembly with composite blades. 4,524,499, Cl. 29-156.80B.
Groom, James S.; and McIntyre, Robert W., to Package Machinery Company. Cartoning method. 4,524,564, Cl. 53-449.000.
Grover, William E.; and Bruce, Anthony R., to Grover, William E. Copier apparatus. 4,525,064, Cl. 355-75.000.
Groves, Michael R., to Coulter Electronics, Inc. Cell breakdown. 4,525,666, Cl. 324-71.100.
Grumman Aerospace Corporation: *See*—
Gebhard, David F., 4,524,929, Cl. 244-63.000.
Wertheim, Max M.; and Herbermann, Richard J., 4,525,633, Cl. 290-44.000.
Grundig E.M.V.: *See*—
Mangold, Hans; Eckert, Hans; and Schonborn, Jurgen, 4,525,746, Cl. 358-254.000.
Gruner, Ronald H.: *See*—
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.
GT Development Corporation: *See*—
Green, Charles J.; and Forsythe, Alan K., 4,524,951, Cl. 251-327.000.
GTE Automatic Electric Inc.: *See*—
Simmons, Nathaniel; and Parikh, Kamal I., 4,525,831, Cl. 370-63.000.
GTE Laboratories Incorporated: *See*—
Stites, Francis H., 4,525,863, Cl. 455-83.000.
GTE Products Corporation: *See*—
Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., 4,525,331, Cl. 423-54.000.
Claes, Roger G., 4,525,692, Cl. 333-142.000.
Knoll, William C.; and Bay, David L., 4,525,649, Cl. 315-96.000.
Guardino, Robert F.; and Belly, Robert T., to Eastman Kodak Company. Process for rapidly differentiating between gram-negative and gram-positive microorganisms. 4,525,453, Cl. 435-34.000.
Guillaume, Michel; and Pichot, Michel. Method and device for measuring temperature using a diffraction grating. 4,525,066, Cl. 356-43.000.
Guillet, James E. Photochemical reactions for commercial synthesis. 4,525,255, Cl. 204-158.00R.
Gulf Oil Corporation: *See*—
Heilman, William J.; and Kemp, Richard A., 4,525,557, Cl. 526-128.000.
Gullotti, Damian V.; Winter, Joseph; Young, Kenneth P.; and Evans, Robert D., to International Telephone and Telegraph Corporation. Apparatus for providing improved slurry cast structures by hot working. 4,524,820, Cl. 164-476.000.
Gustafsson, Bo B.: *See*—
Danielson, Carl O.; Gustafsson, Bo B.; Richardsson, Gote E.; and Lundh, Karl-Erik, 4,524,880, Cl. 220-288.000.
Gutsche, Gunter E. Slide-on rotary tools. 4,525,111, Cl. 408-239.00A.
Gyurina, F. Dennis: *See*—
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,525,422, Cl. 428-418.000.
H. Flude & Company (Hinckley) Limited: *See*—
Humphreys, John C., 4,524,705, Cl. 112-121.150.
Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,524,682, Cl. 99-477.000.
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Apparatus for conditioning wafers. 4,524,682, Cl. 99-477.000.
Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,524,682, Cl. 99-477.000.
Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Hans, Rudiger, 4,525,082, Cl. 384-138.000.
Haas, Ronald T.: *See*—
Dunn, James M.; and Haas, Ronald T., 4,525,345, Cl. 424-22.000.
Haberer, Thomas G.: *See*—
Cordes, Harry D.; Haberer, Thomas G.; and Verrando, Marcel G., III, 4,525,183, Cl. 55-179.000.
Habib, Robert. Machine for backing-off and/or grinding drifting spindles provided with teeth. 4,524,544, Cl. 51-92.00R.
Hackamack, Paul, to Cache Technology Corporation. Portable electronic testing apparatus. 4,525,802, Cl. 364-900.000.
Hacker, John H. Thermal insulated building slab. 4,524,553, Cl. 52-169.110.

Hackett, Steven B.: *See*—
Green, Jasper L.; and Hackett, Steven B., 4,525,096, Cl. 403-49.000.
Hadco Corporation: *See*—
Needham, Maurice E., 4,525,246, Cl. 204-15.000.
Haddock, Richard, to Drexler Technology Corporation. Optical data tape cartridge having wide angle read/write surface. 4,524,925, Cl. 242-197.000.
Hage, Manfred; and Junker, Otto, to Wieland-Werke AG. Safety heat-transmitting device. 4,524,822, Cl. 165-141.000.
Hagen, Norman R.: *See*—
Lewis, Arnold; and Hagen, Norman R., 4,525,146, Cl. 433-198.000.
Hagiwara, Syuya; and Hori, Yasuro, to Hitachi, Ltd. Method and apparatus for reducing vibrations of stationary induction apparatus. 4,525,791, Cl. 364-508.000.
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, to Kanebo, Ltd.; and Kanto Chemical Co., Inc. Particle-packed fiber article having antibacterial property. 4,525,410, Cl. 428-198.000.
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, to BASF Aktiengesellschaft. Particulate polystyrene containing blowing agent and having improved expandability. 4,525,484, Cl. 521-56.000.
Hahn, Ulf: *See*—
Altenau, Ernst-Wilhelm; Hahn, Ulf; and Sabranski, Udo, 4,524,696, Cl. 102-491.000.
Hailey, Laurence N.: *See*—
Boecker, Wolfgang D. G.; and Hailey, Laurence N., 4,525,461, Cl. 501-90.000.
Haines, Frederick K. Air release and anti-siphon valve. 4,524,794, Cl. 137-202.000.
Hair, James M., III: *See*—
Prosan, Richard; Hair, James M., III; and Sheppard, Donald A., 4,525,805, Cl. 364-900.000.
Hakulinen, Martti J. A.: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.
Hakumoto, Mitsuhiro: *See*—
Takai, Kazuki; Hakumoto, Mitsuhiro; and Yamada, Yasuo, 4,525,756, Cl. 360-75.000.
Halcon SD Group, Inc., The: *See*—
Cascone, Ronald F.; and Solomon, C. Ashley, 4,524,581, Cl. 60-39.020.
Hall, Charles W.; and Anderson, Orin M., to Southwest Research Institute. Continuous rotation reversible pitch axial thrust heart pump. 4,524,466, Cl. 603-3.000.
Hall, Dale G., to Ranco Incorporated. Electrically controlled pressure transducer valve. 4,524,948, Cl. 251-139.000.
Hall, David A.; and Spitzer, Wayne A., to Eli Lilly and Company. Process for preparing oxazolinoazetidinones. 4,525,304, Cl. 260-245.400.
Hall, David R., to Megadiamond Industries, Inc. Composite polycrystalline diamond. 4,525,178, Cl. 51-309.000.
Halliburton Company: *See*—
Brisco, David P., 4,524,998, Cl. 285-101.000.
Fore, William M., 4,524,825, Cl. 166-139.000.
Hanlon, David J.; and Almond, Stephen W., 4,524,829, Cl. 166-294.000.
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Gallup, Jeffrey M., 4,525,804, Cl. 364-900.000.
Sabins, Fred; and Childs, Jerry D., 4,524,828, Cl. 166-293.000.
Son, Adelina J.; and Loftin, Royal E., 4,525,285, Cl. 252-8.50M.
Halter, Jerome B.: *See*—
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Halvorsen, Stephen H. Trolling board. 4,524,538, Cl. 43-43.130.
Hamada, Masanori; and Ono, Sadao, to Clarion Co., Ltd. Diversity receiver. 4,525,869, Cl. 455-277.000.
Hamalainen, Kaarlo J., to RCA Corporation. Automatic tracking system for multitrack recorders. 4,525,750, Cl. 358-327.000.
Hamel, Peter; and Karmann, Rudiger, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Steering and stabilization system for vehicles. 4,525,784, Cl. 364-434.000.
Hamerla, Donald R., to General Electric Co. Enhanced reliability data storage system with second memory for preserving time-dependent progressively updated data from destructive transient conditions. 4,525,800, Cl. 364-900.000.
Hammerschmidt, Peter; and Crass, Gunther, to Hoechst Aktiengesellschaft. Adhesive tape. 4,525,416, Cl. 428-220.000.
Hanak, Joseph J., to RCA Corporation. Method of controllong the deposition of hydrogenated amorphous silicon and apparatus therefor. 4,525,375, Cl. 427-8.000.
Hance, William G.: *See*—
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.
Handley, Kirk H., to Ampex Corporation. System and method for synchronization of rotary head magnetic recording/reproducing devices. 4,525,754, Cl. 360-51.000.
Handy, Richard L.: *See*—
Pabst, Mark W.; and Handy, Richard L., 4,524,626, Cl. 73-784.000.
Haneda, Satoshi: *See*—
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,525,056, Cl. 355-3.0DD.
Hankel, Dirk, to Metallgesellschaft Aktiengesellschaft. Process of producing briquettes to be charged to zinc-producing shaft furnaces. 4,525,207, Cl. 75-3.000.
Hanlon, David J.; and Almond, Stephen W., to Halliburton Company. Method of altering the permeability of a subterranean formation. 4,524,829, Cl. 166-294.000.
Hanna, Marie R.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,525,364, Cl. 426-3.000.
Hanna, Thomas B. Animal halter apparatus. 4,524,569, Cl. 54-24.000.
Hans, Rudiger: *See*—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Hans, Rudiger, 4,525,082, Cl. 384-138.000.
Hanseler, Urs; Meier, Urs; and Muther, Franz, to Contraves AG. Circuit board module mounting unit. 4,525,771, Cl. 361-413.000.
Hansen, Earl S. Closed circuit fuel vapor system. 4,524,746, Cl. 123-538.000.
Hanson, Steven P.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Action matching game. 4,524,967, Cl. 273-1.0GE.
Hara, Susumu: *See*—
Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, 4,525,180, Cl. 55-37.000.
Hara, Yoshihumi; Takano, Hiroji; Kabashima, Shoshi; and Hasegawa, Mikio, to Matsushita Electric Industrial Co., Ltd. Laminated core producing apparatus. 4,524,507, Cl. 29-564.200.
Harada, Hiromi: *See*—
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, 4,525,208, Cl. 75-25.000.
Haramaki, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Exposure apparatus to guide reflected light from a subject to a photosensitive body. 4,525,059, Cl. 355-8.000.
Harden, Jerrell W., to Allied Products Corporation. Soil conditioning and bed preparation apparatus. 4,524,837, Cl. 172-156.000.
Hardinge Brothers, Inc.: *See*—
Waldron, Joseph P.; and Brown, Ivan R., 4,524,655, Cl. 82-36.00A.
Hardy, Georjes: *See*—
Jeanrat, Roger G.; Martin, Pierre M.; and Hardy, Georjes, 4,524,680, Cl. 99-277.100.
Hardy, Robert M.; and Premerlani, William J., to General Electric Company. Apparatus and method to protect motors and to protect motor life. 4,525,763, Cl. 361-24.000.
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, to Thomson-CSF. Thermoelectric effect display device. 4,525,708, Cl. 340-713.000.
Hareng, Michel; Perbet, Jean-Noel; and Defrance, Michel, to Thomson-CSF. Electrically controlled display device. 4,525,709, Cl. 340-719.000.
Hargunani, Ashok B.; and Chou, Clifford C., to Ford Motor Company. Method of impact testing motor vehicles. 4,524,603, Cl. 73-12.000.
Harlamert, W. Benjamin: *See*—
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,524,499, Cl. 29-156.80B.
Harrar, Jackson E.: *See*—
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,525,252, Cl. 204-101.000.
Harriman, Robert W., to Keene Corporation. Radiation resistant closure. 4,525,595, Cl. 174-35.0GC.
Harris, Alfred W., to Boeing Company, The. Hinge structure with controlled translation of hinge axis. 4,524,485, Cl. 16-364.000.
Harris Corporation: *See*—
Pan, Jing-Jong; and Wilson, John B., 4,525,680, Cl. 330-277.000.
Harris, Harold D.; and Harris, Thomas J. Friction heat generator. 4,524,755, Cl. 126-247.000.
Harris, Hubert; and Smith, Durward A., to Auburn Research Foundation. Methods and apparatus for thermal blast feeling, skinning, or shelling of food products. 4,524,681, Cl. 99-474.000.
Harris, Martin, to Shell Oil Company. Insecticidal N-substituted-2-(nitromethylene)-tetrahydro-2H-1,3-thiazines. 4,525,474, Cl. 514-226.000.
Harris, Thomas J.: *See*—
Harris, Harold D.; and Harris, Thomas J., 4,524,755, Cl. 126-247.000.
Hartmann, Heinrich: *See*—
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Raubenheimer, Hans-Jurgen, 4,525,581, Cl. 528-503.000.
Hartsock, Dale L., to Ford Motor Company. Method and apparatus for modifying the combustion chamber of an engine to accept ceramic liners. 4,524,498, Cl. 29-156.4WL.
Harz, Peter: *See*—
Krude, Werner; Jordan, Alfons; and Harz, Peter, 4,525,098, Cl. 403-280.000.
Hasegawa, Mikio: *See*—
Hara, Yoshihumi; Takano, Hiroji; Kabashima, Shoshi; and Hasegawa, Mikio, 4,524,507, Cl. 29-564.200.
Hashimoto Corportion: *See*—
Hashimoto, Kazuo, 4,525,600, Cl. 179-6.020.
Hashimoto, Junji: *See*—
Sawano, Susumu; Gofuku, Yoshihiro; Hashimoto, Junji; and Ando, Takayuki, 4,524,851, Cl. 188-134.000.
Hashimoto, Kazuo, to Hashimoto Corportion. Automatic telephone answering device. 4,525,600, Cl. 179-6.020.
Hashimoto, Seiji; Suga, Akira; and Tanaka, Nobuyoshi, to Canon Kabushiki Kaisha. Color solid state image pick-up device. 4,525,737, Cl. 358-44.000.

Hashimoto, Yasuo: *See*—
Ishino, Ken; and Hashimoto, Yasuo, 4,525,614, Cl. 219-10.55D.
Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,525,479, Cl. 514-469.000.
Hata, Hitoshi: *See*—
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,525,290, Cl. 252-73.000.
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, to Pioneer Electronic Corporation. Information recording system. 4,525,824, Cl. 369-45.000.
Hattori, Shinichiro; Hosoda, Seiichi; and Takamatsu, Takeshi, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,524,761, Cl. 128-6.000.
Hauers, Manfred; and Baur, Walter, to Rovema Verpackungsmaschinen GmbH & Co. KG. Packaging machine. 4,524,566, Cl. 53-534.000.
Hauk, Peter: *See*—
Ziegler, Rolf; and Hauk, Peter, 4,524,643, Cl. 74-801.000.
Haupt, Heinrich: *See*—
Bonten, Heinz; Nielinger, Werner; Michael, Dietrich; and Haupt, Heinrich, 4,525,505, Cl. 524-100.000.
Haupt, Robert C., to Allis-Chalmers Corp. Transmission shifting mechanism. 4,524,634, Cl. 74-473.00R.
Hauser, Henry W., Jr., to Alcan Aluminum Corporation. Cable-coating extruder head system with changeable die and guider elements. 4,525,131, Cl. 425-114.000.
Hayami, Ryozo: *See*—
Ebata, Yoshihiro; Tamari, Nobuyuki; Toibana, Yasuo; and Hayami, Ryozo, 4,525,387, Cl. 427-190.000.
Hayashi, Ikuo; Itikawa, Tadao; Ogihara, Keizo; and Shimizu, Kiyoshi, to Nitto Boseki Co. Ltd. Process for producing sequential polyamino acid resin. 4,525,576, Cl. 528-313.000.
Hayashi, Isao: *See*—
Murata, Masanori; and Hayashi, Isao, 4,524,633, Cl. 74-473.00R.
Hayashi, Masaaki; and Sasaki, Hiroharu, to Dai Nippon Toryo Co., Ltd. Non-aqueous dispersion type resin composition. 4,525,499, Cl. 523-523.000.
Hayashida, Hajime: *See*—
Yamamoto, Jun; Hayashida, Hajime; and Takahashi, Hiroyoshi, 4,524,669, Cl. 84-433.000.
Hayes, Daniel F.; Sias, Robert G.; Chesney, Lloyd; and Waldron, John W., to MED Products, Inc. Method and apparatus for purification of water. 4,525,253, Cl. 204-149.000.
Hayes, James S.: *See*—
Chaker, Mouhanad; Clark, Roger J.; and Hayes, James S., 4,525,507, Cl. 524-104.000.
Haylock, John C.: *See*—
Hochberg, Arie; Haylock, John C.; and Mason, Charles D., 4,525,513, Cl. 524-288.000.
Heaston, Gaylord E.; and Farazandeh, Edward A., to Litton Industrial Products, Inc. Automatic double disc grinder control cycle. 4,524,547, Cl. 51-165.770.
Heath, Perry C.: *See*—
Chou, Ta-Sen; and Heath, Perry C., 4,525,587, Cl. 544-025.000.
Heckler, Manfred: *See*—
Schwellinger, Pius; Ried, Alois; Timm, Jurgen; and Heckler, Manfred, 4,525,326, Cl. 420-535.000.
Hedrich, Winfried: *See*—
Rathert, Horst; and Hedrich, Winfried, 4,524,857, Cl. 198-409.000.
Hefer, Fred W., to Oyo Corporation, U.S.A. Horizontal geophone transducer assembly. 4,525,819, Cl. 367-188.000.
Hehlen, Robert: *See*—
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.
Heilman, William J.; and Kemp, Richard A., to Gulf Oil Corporation. Catalyst and process for the polymerization of ethylene. 4,525,557, Cl. 526-128.000.
Heinz, Richard; and Kutzner, Reinhard, to Robert Bosch GmbH. Method and apparatus for maintaining word synchronization after a synchronizing word dropout in reproduction of recorded digitally encoded signals. 4,525,840, Cl. 371-47.000.
Heitz, Walter: *See*—
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; and Heitz, Walter, 4,525,579, Cl. 528-388.000.
Hemmerle, Clayton J.; and Basinger, Richard A. Method of replacing worn and/or damaged surfaces. 4,524,504, Cl. 29-450.000.
Hendriks, Ivo G. M.: *See*—
Liekens, J. Alfons F.; and Hendriks, Ivo G. M., 4,524,561, Cl. 53-397.000.
Henkel Kommanditgesellschaft (Henkel KGaA): *See*—
Hofer, Rainer; and Bartnick, Bernhard, 4,525,525, Cl. 524-742.000.
Henkel Kommanditgesellschaft (KGaA): *See*—
Herold, Julius; and Geisen, Ingeborg, 4,525,234, Cl. 156-332.000.
Hennessy, Thomas F., to Lori Corporation. Side bar lock with enhanced pick resistance. 4,524,593, Cl. 70-358.000.
Henning, Rainer; and Urbach, Hansjorg, to Hoechst Aktiengesellschaft. Process for the preparation of N-alkylated dipeptides and their esters. 4,525,301, Cl. 260-112.50R.
Henrion, Romain: *See*—
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.
Henry, Paul M., to Burr-Brown Corporation. Precision band-gap voltage reference circuit. 4,525,663, Cl. 323-280.000.
Henson, James H., to Swimaid, Inc. Electrochemical ionization system for purifying water. 4,525,272, Cl. 210-149.000.
Herbermann, Richard J.: *See*—
Wertheim, Max M.; and Herbermann, Richard J., 4,525,633, Cl. 290-44.000.
Hernandez, Gonzalo J., to United States of America, Commerce. Twin-etalon scanning spectrometer. 4,525,067, Cl. 356-346.000.
Herold, Julius; and Geisen, Ingeborg, to Henkel Kommanditgesellschaft (KGaA). Adhesive, pre-gelled plastisols and process of preparation. 4,525,234, Cl. 156-332.000.
Herring, Walter R., to Brockway, Inc. Stackable container. 4,524,883, Cl. 220-462.000.
Hershenson, Fred M.: *See*—
Butler, Donald E.; Hershenson, Fred M.; and Pavia, Michael R., 4,525,476, Cl. 514-326.000.
Hertanu, Herold T.: *See*—
Horowitz, Franklin B.; Pfeffer, Martin; and Hertanu, Herold T., 4,525,071, Cl. 366-152.000.
Hertz, Daniel L., Jr., to Smith International, Inc. Annular seal with V-cut. 4,524,981, Cl. 277-210.000.
Hertz, Daniel L., Jr., to Seals Eastern Inc. Seal for aggressive environments. 4,524,982, Cl. 277-229.000.
Herubel, Jean-Frederic, to N. Schlumberger & Cie. Device for applying a binding on a flexible tubular packing, and improved binding therefor. 4,525,002, Cl. 289-2.000.
Hess, Grant F., to National Gypsum Company. Plastic siding sample case. 4,524,852, Cl. 190-16.000.
Hess, Herman A. Separable fastener. 4,524,495, Cl. 24-590.000.
Hesse, Kurt; and Engel, Hartmut. Light fixture. 4,525,773, Cl. 362-413.000.
Hesselberth, Robert J.; Donaher, Thomas P.; and Sandahl, Joel E., to Spectracom Corp. Disciplined oscillator system with frequency control and accumulated time control. 4,525,685, Cl. 331-10.000.
Hesston Corporation: *See*—
Ratzlaff, Howard J., 4,524,574, Cl. 56-341.000.
Hetzel, Frederick; and McCracken, William G., Jr., to General Electric Company. Method of manufacturing a ballast resistor support member. 4,525,230, Cl. 156-179.000.
Hewlett-Packard Company: *See*—
Wang, Faa-Ching, 4,525,239, Cl. 156-645.000.
Heymer, Gero: *See*—
Schimmel, Gunther; Heymer, Gero; Krause, Werner; and Pieper, Werner, 4,525,333, Cl. 423-112.000.
Heywood, Alan E., to Johnson Matthey Public Limited Company. Composite material. 4,525,433, Cl. 428-670.000.
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., to North American Philips Lighting Corporation. Starting and operating method and apparatus for discharge lamps. 4,525,650, Cl. 315-226.000.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, to Asahi Kasei Kogyo Kabushiki Kaisha; and Hidaka, Hiroyoshi. Isoquinolinesulfonyl derivatives. 4,525,589, Cl. 544-128.000.
Hidefumi Hirai: *See*—
Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, 4,525,180, Cl. 55-37.000.
Higashiyama, Yasushi; Chiba, Shu; and Sawazaki, Norikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical magnetic recording device. 4,525,828, Cl. 369-111.000.
Higby, Jeffrey P.: *See*—
Broughton, George L.; Higby, Jeffrey P.; and Young, Robert F., 4,525,149, Cl. 440-1.000.
Higuchi, Akira; and Okamoto, Miyoshi, to Toray Industries, Inc. Artificial grain leather having different color spot groups. 4,525,169, Cl. 8-485.000.
Hildebrandt, Jurgen, to Deutsche Nemectron GmbH. Apparatus and method for the stimulation of a human muscle. 4,524,774, Cl. 128-421.000.
Hill, Carl J., deceased: *See*—
Hill, William J.; Hill, Carl J., deceased; and Hill, Hazel R., heiress, 4,524,491, Cl. 17-52.000.
Hill, Frank P., Jr.; Alden, John W., Jr.; and Williams, Harry K., to Combustion Engineering, Inc. Primary manway closure redundant restraint. 4,524,729, Cl. 122-498.000.
Hill, Hazel R., heiress: *See*—
Hill, William J.; Hill, Carl J., deceased; and Hill, Hazel R., heiress, 4,524,491, Cl. 17-52.000.
Hill, Michael L.: *See*—
Class, Walter H.; Hurwitt, Steven D.; and Hill, Michael L., 4,525,262, Cl. 204-192.00R.
Hill, William J.; Hill, Carl J., deceased; and by Hill, Hazel R., heiress. Gizzard harvesting apparatus and process. 4,524,491, Cl. 17-52.000.
Hilsum, Cyril, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal reusable signature comparison. 4,525,032, Cl. 350-331.00R.
Hilts, Robert L.; and Crow, Robert W., to Otis Engineering Corporation. Apparatus and methods for orienting devices in side pocket mandrels. 4,524,833, Cl. 166-381.000.
Himmetsberger, Alois: *See*—
Svoboda, Josef; Himmetsberger, Alois; and Szabo, Emilie, 4,524,990, Cl. 280-633.000.
Hino, Masatoshi: *See*—
Sakai, Toshiyuki; Ohta, Yuichi; Minoh, Michihiko; and Hino, Masatoshi, 4,525,747, Cl. 358-284.000.
Hirabayashi, Hiromitsu; Sakurai, Masaaki; and Kagiura, Kazuo, to Canon Kabushiki Kaisha. Image fixing device. 4,525,058, Cl. 355-3.0FU.

Hirabayashi, Masao, to Tokyo Sintered Metal Co., Ltd. Method of manufacturing vent element. 4,524,899, Cl. 228-173.200.

Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, to Hidefumi Hirai. Process for recovery of ethylene from gaseous mixture. 4,525,180, Cl. 55-37.000.

Hirai, Hiromu: *See*—
Tajima, Fujio; and Hirai, Hiromu, 4,525,654, Cl. 318-7.000.

Hiratsuka, Shozaburo: *See*—
Aoki, Akihiro; Hiratsuka, Shozaburo; Yamaguchi, Norihisa; and Makino, Shoji, 4,525,384, Cl. 427-174.000.

Hirose, Takeshi: *See*—
Itoh, Isamu; and Hirose, Takeshi, 4,525,450, Cl. 430-552.000.

Hirota, Kazuo: *See*—
Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, 4,524,824, Cl. 106-35.000.

Hirota, Yoshitsugu: *See*—
Ohsaki, Kozo; Kikuchi, Katsutoshi; and Hirota, Yoshitsugu, 4,525,482, Cl. 518-707.000.

Hirst, John A. B., to Rotabolt Limited. Fastener device. 4,525,114, Cl. 411-9.000.

Hirtsiefer, Karl-Richard: *See*—
Dubiel, Oswald; Hirtsiefer, Karl-Richard; and Wagner, Paul-Heinz, 4,524,651, Cl. 81-57.390.

Hitachi Koki Co., Ltd.: *See*—
Tatsuno, Kimio; and Saito, Susumu, 4,525,024, Cl. 350-6.500.

Hitachi, Ltd.: *See*—
Abe, Yumiko; and Yasuda, Kenji, 4,525,265, Cl. 204-403.000.
Enoki, Takashi; Nakamura, Hiroaki; and Nakashima, Fujio, 4,525,820, Cl. 369-2.000.
Hagiwara, Syuya; and Hori, Yasuro, 4,525,791, Cl. 364-508.000.
Kashiwaya, Mineo; Morita, Kiyomi; and Sakamoto, Masahide, 4,524,739, Cl. 123-339.000.
Kino, Jirou; and Uemura, Toshirou, 4,525,774, Cl. 363-17.000.
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,525,808, Cl. 365-36.000.
Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, 4,525,636, Cl. 307-264.000.
Kuwabara, Shigeyuki, 4,525,801, Cl. 364-900.000.
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.
Nozawa, Masafumi; and Miyazaki, Michio, 4,525,839, Cl. 371-38.000.
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, 4,525,712, Cl. 340-825.310.
Omoda, Koichiro; Inagami, Yasuhiro; Torii, Shunichi; and Nagashima, Shigeo, 4,525,796, Cl. 364-730.000.
Sugiyama, Toshio; Suenaga, Hideo; and Fukui, Yukio, 4,525,823, Cl. 369-44.000.
Tajima, Fujio; and Hirai, Hiromu, 4,525,654, Cl. 318-7.000.
Tatsuno, Kimio; and Saito, Susumu, 4,525,024, Cl. 350-6.500.

Hitachi Metals, Ltd.: *See*—
Meguro, Takashi; Ogata, Yasunobu; and Sawada, Yoshizo, 4,525,222, Cl. 148-121.000.

Hochberg, Arie; Haylock, John C.; and Mason, Charles D., to Allied Corporation. Flame retardant polyamide composition. 4,525,513, Cl. 524-288.000.

Hodges, Jimmie R.: *See*—
Grier, Jesse G.; and Hodges, Jimmie R., 4,525,483, Cl. 521-28.000.

Hoechst Aktiengesellschaft: *See*—
Doessel, Karl-Friedrich, 4,525,444, Cl. 430-96.000.
Hammerschmidt, Peter; and Crass, Gunther, 4,525,416, Cl. 428-220.000.
Henning, Rainer; and Urbach, Hansjorg, 4,525,301, Cl. 260-112.50R.
Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, 4,525,329, Cl. 422-202.000.
Schimmel, Gunther; Heymer, Gero; Krause, Werner; and Pieper, Werner, 4,525,333, Cl. 423-112.000.

Hof, Tette: *See*—
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.

Hofer, Rainer; and Bartnick, Bernhard, to Henkel Kommanditgesellschaft (Henkel KGaA). Use of bis-semiesters of sulfosuccinic acid with polyether diols based on ethylene oxide/propylene oxide or their salts as surface-active agents. 4,525,525, Cl. 524-742.000.

Hoffman, Allan C. Normally closed duckbill valve and method of manufacture. 4,524,805, Cl. 137-846.000.

Hoffman, David W., to Ford Motor Company. Cylindrical post magnetron sputtering system. 4,525,264, Cl. 204-298.000.

Hoffman, Harry S., Jr.; Thompson, Donald R.; and Zimmerman, Luther L., to International Business Machines Corporation. Gas panel interrogation by selective sustain. 4,525,707, Cl. 340-707.000.

Hoffmann-La Roche Inc.: *See*—
Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, 4,525,339, Cl. 424-16.000.

Hofman, Eberhard, to Robert Bosch GmbH. Fuel injection apparatus with an auxiliary pump for pilot and main injection. 4,524,737, Cl. 123-300.000.

Hogg, James W., to Anchor Wire Corporation. Double pronged fastener with partially delaminated adhesive layer. 4,524,939, Cl. 248-467.000.

Hoglund, Allen C. Portable cooking device. 4,524,751, Cl. 126-25.00A.

Hohenhovel, Paul. Pasting machine for a web of material, preferably wallpaper. 4,524,714, Cl. 118-123.000.

Hohmann, Gerhard: *See*—
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, 4,525,561, Cl. 526-220.000.

Hohmann, Thomas C.; Lewis, Norris E.; and Miller, Michael B., to Litton Systems Inc. Fiber optic rotary joint using a reflective surface and tangentially mounted rotor and stator optical fibers. 4,525,025, Cl. 350-96.150.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.

Holberton, Philip M.; Randall, Bruce E.; and Marshall, Jay K., to Sangamo Weston, Inc. Power measurement in an electrical distribution system having three or more wires. 4,525,669, Cl. 324-142.000.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Modular terminal housing. 4,525,018, Cl. 339-91.00R.

Holden, Kirk N., to Motorola, Inc. N-bit carry select adder circuit having only one full adder per bit. 4,525,797, Cl. 364-788.000.

Holik, Andrew S.: *See*—
Cline, Harvey E.; Holik, Andrew S.; and Lorensen, William E., 4,525,858, Cl. 382-1.000.

Holland, Marion D., to Robbins, Robert E. One-way brake bleeder check valve with sealing cap. 4,524,800, Cl. 137-516.270.

Holloway, Gerald C., Jr.: *See*—
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.

Holman, Howard E.; and Turner, Roy D., to T. J. Electronics. Aircraft grounding receptacle. 4,525,014, Cl. 339-14.00R.

Holmberg, Albert E., to Holmberg Company, The. Prefabricated bindable sheet and binding method and apparatus. 4,525,116, Cl. 412-8.000.

Holmberg Company, The: *See*—
Holmberg, Albert E., 4,525,116, Cl. 412-8.000.

Holmwood, Graham; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Method and compositions for regulating plant growth using pyrimidine-butanol compounds. 4,525,204, Cl. 71-92.000.

Holoff, Geraldine, executrix: *See*—
Holoff, Manning, deceased; and Holoff, Geraldine, executrix, 4,524,647, Cl. 294-99.200.

Holoff, Manning, deceased; and by Holoff, Geraldine, executrix. Tweezer assembly. 4,524,647, Cl. 294-99.200.

Homan, Gary R.; and Stickles, David L., to Dow Corning Corporation. Coating method and silicone composition for PSA release coating. 4,525,566, Cl. 528-17.000.

Honeywell Information Systems Inc.: *See*—
Still, David W.; and Economopoulos, Peter C., 4,525,714, Cl. 340-825.830.
Webster, Marvin K.; Flynn, Richard T.; Porter, Marion G.; and Seminsky, George M., 4,525,777, Cl. 364-200.000.

Honzyo, Isao: *See*—
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,525,269, Cl. 208-309.000.

Hoogovens Groep B.V.: *See*—
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.

Hoos, Kazmer: *See*—
Mucsy, Endre; and Hoos, Kazmer, 4,525,661, Cl. 322-4.000.

Hooten, John A.: *See*—
Barnes, Johnny G.; Hooten, John A.; Hurley, Patrick J.; and Miller, Ernest L., 4,525,806, Cl. 364-900.000.

Hoover, Bradley R.; and Bagdal, Karl T. Roll profile gauge. 4,524,546, Cl. 51-165.00R.

Horak, Otto; Falkenberg, Werner; Muders, Rolf; and Beinert, Werner, to Bayer Aktiengesellschaft. Process for the decontamination of effluents. 4,525,283, Cl. 210-762.000.

Hori, Yasuro: *See*—
Hagiwara, Syuya; and Hori, Yasuro, 4,525,791, Cl. 364-508.000.

Horiba, Ltd.: *See*—
Tanaka, Masaru; Noguchi, Naoki; Yoshino, Kenji; and Saitoh, Osamu, 4,525,069, Cl. 356-435.000.

Horikawa, Koji: *See*—
Tanaka, Hideki; Kamimura, Masanori; Horikawa, Koji; and Kawasaki, Katsuyuki, 4,525,158, Cl. 474-167.000.

Horio, Kimihide: *See*—
Tomita, Tsutomu; Horio, Kimihide; and Naganawa, Tadahisa, 4,525,151, Cl. 474-101.000.

Horn, Richard E.; and Rodeheaver, Bradley D., to Electrochem International, Inc. Method and apparatus for electrodialysis. 4,525,259, Cl. 204-182.400.

Hornung, Armin: *See*—
Moll, Reiner; and Hornung, Armin, 4,525,093, Cl. 403-4.000.

Horowitz, Franklin B.; Pfeffer, Martin; and Hertanu, Herold T., to Crawford & Russell, Inc. Additive inventory control, batching and delivery system. 4,525,071, Cl. 366-152.000.

Horr, Kenneth R.: *See*—
Dennison, William G.; Horr, Kenneth R.; and Kindler, Robert I., 4,525,694, Cl. 335-132.000.

Hosaka, Yaoji, to Toyu Food Co-Operative Corporation. Process for manufacturing flavored and patterned tofu. 4,525,373, Cl. 426-634.000.

Hoshi, Hideo; and Kamamori, Hitoshi, to Seiko Instruments & Electronics Ltd. Picture display device. 4,525,710, Cl. 340-784.000.

Hoshino, Shigetaka: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.

Hosoda, Seiichi: *See—*
Hattori, Shinichiro; Hosoda, Seiichi; and Takamatsu, Takeshi, 4,524,761, Cl. 128-6.000.

Hosokawa, Teruo: *See—*
Morita, Hirofumi; and Hosokawa, Teruo, 4,525,629, Cl. 250-396.0ML.

Hotta, Hiroshi; and Suzuki, Yoshiharu, to Polyplastics Co. Ltd. Sputtering method. 4,525,261, Cl. 204-192.0EC.

Howarth, Thomas T.: *See—*
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,352, Cl. 424-114.000.
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,353, Cl. 424-114.000.

Howe, Paul E.: *See—*
Vasconcellos, Stephen R.; Yaghmaie, Farrokh; and Howe, Paul E., 4,525,280, Cl. 210-728.000.

Howells, Richard D.: *See—*
Lynn, Michael M.; and Howells, Richard D., 4,525,423, Cl. 428-421.000.

Howerton, Anderson W.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.

Howie, John K.; and Bullock, Steven S., to Procter & Gamble Company, The. Alpha-phosphono lauramide lubricant additives. 4,525,289, Cl. 252-49.900.

Hoya Corporation: *See—*
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,525,189, Cl. 65-3.150.

Huber, Josef: *See—*
Feusi, Markus; Huber, Josef; Oswald, Heinz; and Pfyffer, Peter, 4,524,918, Cl. 242-18.00A.

Huber, Siegfried, to Bayerische Motoren Werke AG. Safety helmet, especially for motorcyclists. 4,524,465, Cl. 2-424.000.

Huber, William B.: *See—*
Slavik, William H.; and Huber, William B., 4,525,163, Cl. 604-65.000.

Hubner, Horst; Lydtin, Hans; Rehder, Ludwig; and Zaengel, Thomas, to U.S. Philips Corporation. Method of manufacturing an electrode for a high-pressure gas discharge lamp and electrode for such a lamp. 4,525,379, Cl. 427-53.100.

Hubsch, Hubertus: *See—*
Dimigen, Heinz; and Hubsch, Hubertus, 4,525,417, Cl. 428-244.000.

Huckins, Charles M.: *See—*
Holce, Thomas J.; and Huckins, Charles M., 4,525,018, Cl. 339-91.00R.

Hudson, Barry, to BP Chemicals Limited. Coalescing agents. 4,525,512, Cl. 524-284.000.

Huff, Terrence; and Poirot, Eugene E., to Exxon Research & Engineering Co. High efficiency polymerization catalyst component for use in the polymerization of propylene and higher alpha-olefins. 4,525,467, Cl. 502-121.000.

Hughes, Frank M.: *See—*
Field, Thomas R.; Hughes, Frank M.; Shakib, Iraj D.; and Vitek, Edward J., Jr., 4,525,086, Cl. 400-144.200.

Hughes Helicopters, Inc.: *See—*
Wright, Dale M.; and Kiraly, Robert L., 4,524,620, Cl. 73-587.000.

Hujsak, Edward J., to General Dynamics Corporation/Convair Div. Mechanism for deploying a deployable truss beam. 4,524,552, Cl. 52-108.000.

Hulin, Rene ; and Schuler, Daniel, to Automobiles Peugeot/Automobiles Citroen. Manual control device for changing speeds including a locking of the reverse speed. 4,524,635, Cl. 74-476.000.

Hummel, Karl-Ernst; Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, to Suddeutsch Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Heat exchanger having a helical distributor located within the connecting tank. 4,524,823, Cl. 165-174.000.

Humphrey Products Company: *See—*
Toliusis, Vytautas J., 4,524,807, Cl. 137-884.000.

Humphreys, John C., to H. Flude & Company (Hinckley) Limited. Spade gusset seaming apparatus. 4,524,705, Cl. 112-121.150.

Humphries, Benjamin T.; and Spisak, Andrew J., to Westinghouse Electric Corp. Turbine generator with stator end winding support assembly including resilient bracket. 4,525,642, Cl. 310-260.000.

Humpolik, Bohumil: *See—*
Hummel, Karl-Ernst; Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,524,823, Cl. 165-174.000.

Hunt, Joseph M., to Allegheny Ludlum Steel Corporation. Corrosion-resistant tube assembly. 4,524,996, Cl. 285-55.000.

Hunter, Wood E.; and Craun, Gary P., to Calgon Corporation. Method for producing free-flowing, water-soluble polymer gels. 4,525,509, Cl. 524-141.000.

Hunting Oilfield Services (UK) Limited: *See—*
Lumsden, Norman; and Phillips, Brian K., 4,525,001, Cl. 285-328.000.

Hurley, Patrick J.: *See—*
Barnes, Johnny G.; Hooten, John A.; Hurley, Patrick J.; and Miller, Ernest L., 4,525,806, Cl. 364-900.000.

Hurtubise, Gerard. Pipe hanger. 4,524,936, Cl. 248-62.000.

Hurwitt, Steven D.: *See—*
Class, Walter H.; Hurwitt, Steven D.; and Hill, Michael L., 4,525,262, Cl. 204-192.00R.

Hyde Mfg. Co.: *See—*
Mallalieu, David H.; Apostola, Samuel N.; and DeVries, Douglas C., 4,524,514, Cl. 30-169.000.

Hydril Company: *See—*
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,524,832, Cl. 166-347.000.

Hydroperfect International H. P. I.: *See—*
Laumont, Roger, 4,525,126, Cl. 417-310.000.

Hynek, Bernd; Valk, Giselher; and Treptau, Gerhard, to Bayer Aktiengesellschaft; and Girmes Vertriebsgesellschaft fur Industrietextilien mbH. Stabilized pile article, production and use thereof for the treatment of surfaces. 4,525,403, Cl. 428-87.000.

i f m electronic GmbH: *See—*
Buck, Robert; Friedrich, Michael B.; Gesthuysen, Hans D.; and Marhofer, Gerd, 4,525,699, Cl. 340-512.000.

Ichida Hiroshi: *See—*
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, 4,525,441, Cl. 430-46.000.

Ichinohe, Shoji: *See—*
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,525,563, Cl. 526-279.000.

Ichiyanagi, Takashi: *See—*
Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, 4,525,757, Cl. 360-130.240.

Ida, Shunya: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.

Ida, Toshio: *See—*
Kaibara, Nobuhiro; Ida, Toshio; Okuda, Shinji; and Motohashi, Takayuki, 4,524,914, Cl. 239-452.000.

Ide, Eizo; and Fujimura, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic weld line following method. 4,525,619, Cl. 219-124.220.

Ide, Susumu: *See—*
Kohashi, Tadao; Irie, Hiroyuki; Ide, Susumu; and Esaki, Hiroshi, 4,525,727, Cl. 346-140.00R.

Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; and Heitz, Walter, to Bayer Aktiengesellschaft. Process for the production of optionally branched polyarylene sulphides with polyhalogenated polyaromatic compound. 4,525,579, Cl. 528-388.000.

Idemitsu Kosan Company Limited: *See—*
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,525,290, Cl. 252-73.000.

Igarashi, Masahiko: *See—*
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.

Iida, Tomimaru. Desalting system utilizing solar energy. 4,525,242, Cl. 202-177.000.

IIT Research Institute: *See—*
Bridges, Jack E.; Taflove, Allen; and Sresty, Guggilam C., 4,524,827, Cl. 166-248.000.

Ikeda, Yoshiaki, to Seikosha Co., Ltd. Device for adjusting position of printing head of printer. 4,525,084, Cl. 400-55.000.

Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, to Nippon Oil Co., Ltd. Process for the solvent deasphalting of asphaltene-containing hydrocarbons. 4,525,269, Cl. 208-309.000.

Ikemoto, Shigeru. Hand wrapping apparatus. 4,524,559, Cl. 53-219.000.

Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, to Mitsubishi Monsanto Chemical Company. Heat resistant resin composition. 4,525,536, Cl. 525-194.000.

Imada, Isuke: *See—*
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,525,361, Cl. 514-689.000.

Imagawa, Kenichi: *See—*
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, 4,525,300, Cl. 260-112.50R.

Imahashi, Issei; and Asakawa, Teruo, to Telmec Co., Ltd. Positioning stage having a vibration suppressor. 4,525,659, Cl. 318-649.000.

Imai, Fusao; and Okumura, Norio, to Toyo Boseki Kabushiki Kaisha. Polyurethane elastic yarns and their production. 4,525,420, Cl. 428-372.000.

Imai, Hirosuke: *See—*
Sakata, Ko; and Imai, Hirosuke, 4,525,457, Cl. 435-178.000.

Imai, Kiyoshi: *See—*
Nakajima, Junya; Imai, Kiyoshi; and Nakamura, Takashi, 4,525,449, Cl. 430-407.000.

Imajima, Mitsuhiro: *See—*
Tomioka, Mitsuharu; and Imajima, Mitsuhiro, 4,525,137, Cl. 431-76.000.

Imamura, Shigeyuki; Misaki, Hideo; and Muto, Naoki, to Toyo Jozo Company, Ltd. Method for the production of sphingomyelinase. 4,525,458, Cl. 435-196.000.

Imani, Kambiz: *See—*
Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz, 4,524,471, Cl. 5-8.000.

Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, to Matsushita Electric Industrial Co., Ltd. Rotary head assembly. 4,525,757, Cl. 360-130.240.

Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, to General Research of Electronics, Inc. Antenna with coaxial connector. 4,525,718, Cl. 343-702.000.

Imazeki, Kazuyoshi; and Wani, Hasashi, to General Research of Electronics, Inc. Amplified video signal distributing apparatus. 4,525,738, Cl. 358-181.000.
Imhof, Heinrich, to Ingenieurburo Imhof GmbH. Assembly for sealing an annular gap between the wall of a large vessel and a floating cover. 4,524,878, Cl. 220-224.000.
Imperial Chemical Industries Limited: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,525,330, Cl. 423-24.000.
Imphy S.A.: *See—*
Duffaut, Francois, 4,525,431, Cl. 428-638.000.
INA Walzlager Schaeffler KG: *See—*
Bender, Rolf; Jacob, Werner; and Pfuderer, Horst, 4,524,671, Cl. 89-14.050.
Inagami, Yasuhiro: *See—*
Omoda, Koichiro; Inagami, Yasuhiro; Torii, Shunichi; and Nagashima, Shigeo, 4,525,796, Cl. 364-730.000.
Inagi, Toshio; Muramatsu, Toyojiro; and Nagai, Hidetaka, to Kowa Company Limited. Antiinflammatory analgesic gelled ointment. 4,525,347, Cl. 424-81.000.
Inamura, Akio, to Yoshida Kogyo K. K. Watertight slide fastener. 4,524,493, Cl. 24-389.000.
Indian Head Inc.: *See—*
Pate, Harold T.; and Fochler, Helmut P., 4,524,999, Cl. 285-158.000.
Industrial Management Co.: *See—*
Rooklyn, Jack, 4,525,398, Cl. 428-40.000.
Ingelmann, Hans-Joachim: *See—*
Hummel, Karl-Ernst; Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,524,823, Cl. 165-174.000.
Ingenieurburo Imhof GmbH: *See—*
Imhof, Heinrich, 4,524,878, Cl. 220-224.000.
Ingeniorsfirma N.D.C. Netzler & Dahlgren Co Aktiebolag: *See—*
Nilsson, Arne H. A., 4,524,931, Cl. 246-167.00D.
Inooka, Masayoshi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for hydrocracking hydrocarbons with hydrotreatment-regeneration of spent catalyst. 4,525,267, Cl. 208-58.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,524,543, Cl. 51-34.00R.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Vibratory abrasive contour-finishing method and apparatus. 4,524,543, Cl. 51-34.00R.
Inoue, Masao; Suzuki, Shingo; and Gotoh, Hajime, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,525,029, Cl. 350-128.000.
Intech Corporation: *See—*
Glaze, John W., Jr., 4,524,889, Cl. 223-76.000.
Integral Profilsystem Ab: *See—*
Johansson, Lars, 4,525,408, Cl. 428-159.000.
Intermedicat GmbH: *See—*
Leclerc, Roland-Yves J., 4,525,166, Cl. 604-133.000.
International Business Machines Corporation: *See—*
Alpaugh, Warren A.; Amelio, William J.; Markovich, Voya; and Sambucetti, Carlos J., 4,525,390, Cl. 427-305.000.
Barnes, Johnny G.; Hooten, John A.; Hurley, Patrick J.; and Miller, Ernest L., 4,525,806, Cl. 364-900.000.
Beha, Johannes G.; Jaeckel, Heinz; and Vettiger, Peter, 4,525,730, Cl. 357-5.000.
Bradshaw, Richard L., 4,525,424, Cl. 428-425.900.
Chappell, Terry I.; Jackson, Thomas N.; and Woodall, Jerry M., 4,525,731, Cl. 357-12.000.
Cochran, William H.; and Wu, Philip T., 4,525,810, Cl. 365-102.000.
Cruz, Claude A.; and Vermeulen, Johannes C., 4,525,641, Cl. 307-465.000.
Field, Thomas R.; Hughes, Frank M.; Shakib, Iraj D.; and Vitek, Edward J., Jr., 4,525,086, Cl. 400-144.200.
Franaszek, Peter A.; and Yarmchuk, Edward J., 4,525,724, Cl. 346-74.500.
Gray, Randall C., 4,525,638, Cl. 307-350.000.
Hoffman, Harry S., Jr.; Thompson, Donald R.; and Zimmerman, Luther L., 4,525,707, Cl. 340-707.000.
Patel, Arvind M., 4,525,838, Cl. 371-37.000.
Sachdev, Krishna G.; Sachdev, Harbans S.; Aviram, Ari; and Wizner, Mark A., 4,525,722, Cl. 346-1.100.
International Flavors & Fragrances Inc.: *See—*
Wiegers, Wilhelmus J.; Fenn, Ronald S.; Boden, Richard M.; and Schreiber, William L., 4,524,783, Cl. 131-276.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,525,364, Cl. 426-3.000.
International Standard Electric Corporation: *See—*
Vance, Ian A. W.; and Bainton, Stephen D., 4,525,835, Cl. 370-29.000.
International Telephone and Telegraph Corporation: *See—*
Ghosh, Chuni L., 4,525,448, Cl. 430-314.000.
Gullotti, Damian V.; Winter, Joseph; Young, Kenneth P.; and Evans, Robert D., 4,524,820, Cl. 164-476.000.
Interox Chemicals Limited: *See—*
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,525,291, Cl. 252-95.000.
Intevep, S.A.: *See—*
Morales, Alfredo; Galiasso, Roberto; and Carrasquel, Angel R., 4,525,472, Cl. 502-323.000.
Intini, Anthony V., Jr. Flat tip spoon. 4,524,513, Cl. 30-149.000.
Iowa State University Research Foundation, Inc.: *See—*
Pabst, Mark W.; and Handy, Richard L., 4,524,626, Cl. 73-784.000.
Irie, Hiroyuki: *See—*
Kohashi, Tadao; Irie, Hiroyuki; Ide, Susumu; and Esaki, Hiroshi, 4,525,727, Cl. 346-140.00R.
Irvine, Robert: *See—*
Silverman, Harold; Ramsey, James S.; and Irvine, Robert, 4,524,557, Cl. 53-55.000.
Iscar Limited: *See—*
Porat, Reuven, 4,525,415, Cl. 428-216.000.
Isernhagen, Fritz: *See—*
Reinecke, Erich; and Isernhagen, Fritz, 4,524,850, Cl. 188-71.800.
Ishida, Takashi: *See—*
Tominari, Noboru; and Ishida, Takashi, 4,524,745, Cl. 123-478.000.
Ishihara Sangyo Kaisha, Ltd.: *See—*
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, 4,525,441, Cl. 430-46.000.
Ishii, Fumiaki: *See—*
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.
Ishii, Shinichi: *See—*
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.
Ishii, Tamaki: *See—*
Yachigo, Shinichi; Ishii, Tamaki; Takahashi, Yukoh; and Terada, Yutaka, 4,525,514, Cl. 524-291.000.
Ishikawa, Toshiro: *See—*
Shimeki, Yasuharu; Kato, Misao; Matsushima, Hiroshi; and Ishikawa, Toshiro, 4,525,753, Cl. 360-45.000.
Ishikawa, Yukio: *See—*
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, 4,525,208, Cl. 75-25.000.
Ishino, Ken; and Hashimoto, Yasuo, to TDK Corporation. Absorber device for microwave leakage. 4,525,614, Cl. 219-10.55D.
Ishiyama, Shinobu: *See—*
Konomi, Toshiaki; and Ishiyama, Shinobu, 4,525,781, Cl. 364-431.010.
Ishizaki, Keiichi; and Fuchigami, Shuzo, to Fuji Photo Film Company, Limited. Method of simultaneously applying multiple layers to web. 4,525,392, Cl. 427-420.000.
Isobe, Kenichi: *See—*
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,525,563, Cl. 526-279.000.
Isoya, Toshiro: *See—*
Yamataka, Kazunori; and Isoya, Toshiro, 4,525,251, Cl. 204-79.000.
Isuzu Motor, Ltd.: *See—*
Kawamura, Hideo; Sagawa, Nobukazu; and Yamamoto, Noriyoshi, 4,525,622, Cl. 219-270.000.
Italiano, Pietro; and Riva, Ermete, to Carlo Erba Strumentazione S.p.A. Porosimeter with detection by capacity variations. 4,524,605, Cl. 73-38.000.
Itami, Teruhiko: *See—*
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, 4,525,723, Cl. 346-74.400.
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Developing means for electrostatic latent image. 4,525,056, Cl. 355-3.0DD.
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, to Hokuriku Pharmaceutical Co., Ltd. N-substituted flavone-8-carboxamides. 4,525,356, Cl. 514-234.000.
Itikawa, Tadao: *See—*
Hayashi, Ikuo; Itikawa, Tadao; Ogihara, Keizo; and Shimizu, Kiyoshi, 4,525,576, Cl. 528-313.000.
ITM International Tool Machines Inc.: *See—*
Giebmanns, Karl-Heinz, 4,524,545, Cl. 51-99.000.
Ito, Kenichi; Musha, Tohru; Kato, Kiichi; and Yamamoto, Kimiaki, to Olympus Optical Co., Ltd. Method and apparatus for detecting focussing and tracking error signals. 4,525,825, Cl. 369-45.000.
Ito, Kiyoshi, to Komori Printing Machinery Co., Ltd. Varnish coater for printed product. 4,524,712, Cl. 118-46.000.
Ito, Osamu; Yamasaki, Harumasa; Minakata, Itsuo; and Nishizawa, Kazunori, to Kao Corporation. Twisted yarn. 4,524,577, Cl. 57-200.000.
Itoh, Isamu; and Hirose, Takeshi. Silver halide color photographic light sensitive material containing a coupler containing at least one of a sulfamoylphenylenesulfonyl, sulfamoylaminophenylenesulfonyl, or sulfoamidophenylenesulfonyl group. 4,525,450, Cl. 430-552.000.
Iwata, Ryuichi: *See—*
Sato, Ikuro; and Iwata, Ryuichi, 4,525,719, Cl. 343-761.000.
Iwatani, Kazutoshi: *See—*
Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, 4,525,554, Cl. 526-124.000.
Iwatsu Electric Co., Ltd.: *See—*
Kinoshita, Kunio; and Kokaji, Norio, 4,525,725, Cl. 346-74.500.
Sawano, Katsutoshi; and Miyashita, Tetsuharu, 4,525,667, Cl. 324-140.00R.
J/Mac Corporation: *See—*
Jones, William R., 4,524,912, Cl. 239-150.000.
J. Stanley Miller Corporation: *See—*
Miller, Stanley, 4,525,243, Cl. 202-181.000.
Jackson, Thomas N.: *See—*
Chappell, Terry I.; Jackson, Thomas N.; and Woodall, Jerry M., 4,525,731, Cl. 357-12.000.

Jacob, Ezekiel J.: *See*—
Pitz, Richard J.; and Jacob, Ezekiel J., 4,525,147, Cl. 433-224.000.
Jacob, Philippe: *See*—
Gourlia, Jean-Paul; Jacob, Philippe; and Jamen, Robert, 4,525,244, Cl. 203-26.000.
Jacob, Werner: *See*—
Bender, Rolf; Jacob, Werner; and Pfuderer, Horst, 4,524,671, Cl. 89-14.050.
Jacobs, Erwin P.: *See*—
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, 4,525,378, Cl. 427-38.000.
Jaeckel, Heinz: *See*—
Beha, Johannes G.; Jaeckel, Heinz; and Vettiger, Peter, 4,525,730, Cl. 357-5.000.
Jaggi, Ernst, to Swiss Aluminium Ltd. Device for controlled batch feeding of a fluidizible particulate material and process for its operation. 4,525,105, Cl. 406-50.000.
Jamen, Robert: *See*—
Gourlia, Jean-Paul; Jacob, Philippe; and Jamen, Robert, 4,525,244, Cl. 203-26.000.
James Burn Bindings Limited: *See*—
Jones, Leonard W. N., 4,525,117, Cl. 412-39.000.
James, Jack E.: *See*—
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, to Commissariat a l'Energie Atomique; and Office National d'Etudes et de Recherche Aerospatiales. Process for the manufacture of compact composite carbonaceous materials by densification of porous carbonaceous substrates. 4,525,337, Cl. 423-449.000.
Jamieson, H. William, Jr., to Offset Engineering, Inc. Apparatus for transferring printed material onto a chain delivery. 4,524,964, Cl. 271-204.000.
Jamieson, John R., to Vickers p.l.c. Derrick crane. 4,524,875, Cl. 212-239.000.
Janczer, Peter: *See*—
Brugger, Manfred; Janczer, Peter; and Peter, Hans, 4,524,817, Cl. 164-290.000.
Jansen, Dirk: *See*—
Wildermuth, Eberhard; Jansen, Dirk; Burkhardt, Rudolf; and Merz, Joachim, 4,525,717, Cl. 343-452.000.
Japan Inorganic Material Co., Ltd.: *See*—
Kawai, Kyosuke; Nakagawa, Mitsuru; Yanase, Shinji; and Kawai, Kiyoshi, 4,525,190, Cl. 65-14.000.
Japanese Foundation for Cancer Research: *See*—
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, 4,525,300, Cl. 260-112.50R.
Jasch, Gunter: *See*—
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, 4,524,717, Cl. 118-718.000.
Jaschke, Max J.: *See*—
Seitz, Fred H.; and Jaschke, Max J., 4,524,976, Cl. 273-388.000.
Jason, Barry L., to Motorola, Inc. Current mirror having base current error cancellation circuit. 4,525,683, Cl. 330-288.000.
Jaunich, Helmut: *See*—
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.
Jeanrat, Roger G.; Martin, Pierre M.; and Hardy, Georjes, to Methode Champenoise Automatisee-M C.A. G.I.E. Device for riddling bottles according to the champagne method. 4,524,680, Cl. 99-277.100.
Jeffrey, Jewell W., to Lewis, Lloyd James, a part interest. Combination level system for a thin rule. 4,524,527, Cl. 33-451.000.
Jensen, Jack E., to CVI Incorporated. Cryogenic refrigerator. 4,524,586, Cl. 62-6.000.
Jensen, Thomas H., to PPG Industries, Inc. Fiber forming bushing and method for using same. 4,525,188, Cl. 65-1.000.
Jidosha Kiki Co., Ltd.: *See*—
Kobayashi, Michio, 4,524,584, Cl. 60-554.000.
Jin-Luh, Su: *See*—
Maw-Cheng, Shieh; Seng-Jung, Chen; Li-Jung, Hu; and Jin-Luh, Su, 4,525,210, Cl. 75-58.000.
Johansson, Lars, to Integral Profilsystem Ab. Insulation of aluminum profiles in a fixture. 4,525,408, Cl. 428-159.000.
John, Gunter: *See*—
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
John Hopkins University, The: *See*—
Fischell, Robert E.; Newman, Arnold L.; Riblet, Henry B.; and Powell, William R., 4,524,773, Cl. 128-419.00S.
Johns Hopkins University, The: *See*—
Fischell, Robert E., 4,525,165, Cl. 604-131.000.
Johnson, Benjamin M., to Electric Power Research Institute, Inc. Steam condensing apparatus. 4,524,728, Cl. 122-459.000.
Johnson, James D.; Belden, Byron B.; and Kamp, Terrence A., to Reliance Electric Company. Powdered metal, flanged bushing for securing machine elements to shafts. 4,525,094, Cl. 403-11.000.
Johnson & Johnson Dental Products Company: *See*—
Martin, Brian, 4,525,256, Cl. 204-159.180.
Johnson, Martin: *See*—
Baker, Peter J.; Brookes, David A.; and Johnson, Martin, 4,525,173, Cl. 44-51.000.
Johnson Matthey Public Limited Company: *See*—
Heywood, Alan E., 4,525,433, Cl. 428-670.000.
Johnson Products Co., Inc.: *See*—
Khalil, Ezzat N.; and Cheslow, Ernest, 4,524,787, Cl. 132-7.000.
Joint Medical Products Corp.: *See*—
DeCarlo, Alfred F., Jr., 4,524,467, Cl. 603-22.000.
Jones, Larry J., to Gard Corporation. Ampule cleaning and quality control system. 4,525,219, Cl. 134-1.000.
Jones, Leonard W. N., to James Burn Bindings Limited. Wire binding machines. 4,525,117, Cl. 412-39.000.
Jones, Stephen R., to Standard Telephones and Cables plc. Optical fibre reinstatement. 4,525,312, Cl. 264-1.500.
Jones, Wendy; and Gerber, Bego, to BTC Diagnostics Limited Partnership. Enzyme immunoassay with step of immersing sample in deionized water. 4,525,452, Cl. 435-7.000.
Jones, William H.; and Chambers, Worthy L., to Eaton Corporation. Thermally responsive controller and switch assembly therefor. 4,525,697, Cl. 337-354.000.
Jones, William R., to J/Mac Corporation. Agricultural portable chemical applicator with protective shield. 4,524,912, Cl. 239-150.000.
Jordan, Alfons: *See*—
Krude, Werner; Jordan, Alfons; and Harz, Peter, 4,525,098, Cl. 403-280.000.
Joseph Ayers, Inc.: *See*—
Pratt, Charles E., 4,525,307, Cl. 556-182.000.
Jouve, Hubert; and Magnin, Joel, to Commissariat a l'Energie Atomique. Magnetic bubble store with non-implanted motifs and method for controlling the same. 4,525,807, Cl. 365-36.000.
Judas, Herbert: *See*—
Weiss, Ervin; Rosenberg, Melvin; and Judas, Herbert, 4,525,342, Cl. 424-49.000.
Jufuku, Yasunobu: *See*—
Okawa, Susumu; Matsui, Hideaki; Jufuku, Yasunobu; and Kato, Toshimi, 4,525,160, Cl. 474-242.000.
Junker, Otto: *See*—
Hage, Manfred; and Junker, Otto, 4,524,822, Cl. 165-141.000.
Junkosha Company Ltd.: *See*—
Suzuki, Hirosuke; and Ohki, Hajime, 4,525,693, Cl. 333-236.000.
Yasumoto, Hiromi, 4,525,020, Cl. 339-99.00R.
K-Tron International, Inc.: *See*—
Wilson, David H.; and Loe, James M., 4,524,886, Cl. 222-58.000.
Kabashima, Shoshi: *See*—
Hara, Yoshihumi; Takano, Hiroji; Kabashima, Shoshi; and Hasegawa, Mikio, 4,524,507, Cl. 29-564.200.
Kabushiki Kaisha Kanemitsu: *See*—
Oda, Misao, 4,524,595, Cl. 72-84.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Suzuki, Norio; Kajikawa, Hiroshi; and Nishikawa, Tadashi, 4,524,622, Cl. 73-620.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nishikawa, Yoshinori; and Takahashi, Iwashige, 4,525,706, Cl. 340-679.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Koto, Haruhiko, 4,525,728, Cl. 346-140.00R.
Kubota, Satoshi; Nakashima, Mikito; Mogami, Takao; and Nakagawa, Tetsuo, 4,525,421, Cl. 428-412.000.
Ota, Tadashi, 4,525,033, Cl. 350-350.00R.
Kabushiki Kaisha Universal: *See*—
Nishikawa, Ikuo, 4,524,636, Cl. 74-527.000.
Kage, Kouzou; and Watanabe, Hiroshi, to Nippon Electric Co., Ltd.; and Nippon Telegraph & Telephone Public Corporation. Interference wave detection circuit for use in radio receiver. 4,525,868, Cl. 455-206.000.
Kagiura, Kazuo: *See*—
Hirabayashi, Hiromitsu; Sakurai, Masaaki; and Kagiura, Kazuo, 4,525,058, Cl. 355-3.0FU.
Kaibara, Nobuhiro; Ida, Toshio; Okuda, Shinji; and Motohashi, Takayuki, to Diesel Kiki Co., Ltd. Throttling pintle-type fuel injection nozzle having an improved initial injection characteristic. 4,524,914, Cl. 239-452.000.
Kaiser, Gregory A.; DeMunda, Gabriel P.; and Tressler, Richard E., to Kennecott Corporation. Porous semiconductor dopant carriers. 4,525,429, Cl. 428-566.000.
Kajikawa, Hiroshi: *See*—
Suzuki, Norio; Kajikawa, Hiroshi; and Nishikawa, Tadashi, 4,524,622, Cl. 73-620.000.
Kaku, Toshimitsu: *See*—
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.
Kamachi, Hajime: *See*—
Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,525,473, Cl. 514-202.000.
Kamada, Kazumasa; Tamai, Katsumi; Abe, Kazunori; and Shiraishi, Yoshinobu, to Mitsubishi Rayon Co., Ltd. Methacrylic resin shaped article, process for producing the same and process for producing a shaped article having a mat surface from said resin shaped article. 4,525,537, Cl. 525-198.000.
Kamamori, Hitoshi: *See*—
Hoshi, Hideo; and Kamamori, Hitoshi, 4,525,710, Cl. 340-784.000.
Kameya, Kazuo, to Elmec Corporation. Variable delay line. 4,525,691, Cl. 333-139.000.
Kamimura, Masanori: *See*—
Tanaka, Hideki; Kamimura, Masanori; Horikawa, Koji; and Kawasaki, Katsuyuki, 4,525,158, Cl. 474-167.000.
Kammiller, Neil A., to Reliance Electric Company. Circuit for synchronizing a switching power supply to a load clock. 4,525,674, Cl. 328-63.000.

Kamp, Terrence A.: *See—*
Johnson, James D.; Belden, Byron B.; and Kamp, Terrence A., 4,525,094, Cl. 403-11.000.
Kanazawa, Hirotaka, to Mazda Motor Corporation. Flexible coupling for providing variable rate steering. 4,524,842, Cl. 180-132.000.
Kanbe, Junichiro: *See—*
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,525,442, Cl. 430-57.000.
Kanebo, Ltd.: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.
Matsui, Masao; Okamoto, Kazuo; and Naruse, Tutomu, 4,525,404, Cl. 428-92.000.
Kanebo Synthetic Fibers, Ltd.: *See—*
Matsui, Masao; Okamoto, Kazuo; and Naruse, Tutomu, 4,525,404, Cl. 428-92.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Shigeru; and Nakamura, Munehiro, 4,525,486, Cl. 521-59.000.
Maeda, Hirofumi; Nakamura, Kyoichi; and Fukui, Hisatoshi, 4,525,485, Cl. 521-58.000.
Mathumoto, Sigemi; Kubota, Hidetaka; and Nagoshi, Fumiya, 4,525,530, Cl. 525-84.000.
Kaniwec, George N.: *See—*
Krehel, Charles A.; and Kaniwec, George N., 4,524,617, Cl. 73-296.000.
Kanto Chemical Co., Inc.: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.
Kantor, Frederick W. Rotary thermodynamic apparatus and method. 4,524,587, Cl. 62-101.000.
Kanzaki Paper Manufacturing Company, Ltd.: *See—*
Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, 4,525,520, Cl. 524-512.000.
Kao Corporation: *See—*
Ito, Osamu; Yamasaki, Harumasa; Minakata, Itsuo; and Nishizawa, Kazunori, 4,524,577, Cl. 57-200.000.
Karady, Sandor: *See—*
Amato, Joseph S.; Karady, Sandor; and Weinstock, Leonard M., 4,525,582, Cl. 534-558.000.
Karmann, Rudiger: *See—*
Hamel, Peter; and Karmann, Rudiger, 4,525,784, Cl. 364-434.000.
Karn, Donald L., to Monarch Marking Systems, Inc. Print head and method of making same. 4,524,686, Cl. 101-111.000.
Karol, Herman S.: *See—*
Lamb, Miles P.; and Karol, Herman S., 4,525,095, Cl. 403-16.000.
Kashiwa, Norio: *See—*
Ueda, Takashi; and Kashiwa, Norio, 4,525,469, Cl. 502-125.000.
Kashiwaya, Mineo; Morita, Kiyomi; and Sakamoto, Masahide, to Hitachi, Ltd. Engine control method. 4,524,739, Cl. 123-339.000.
Kashiyama, Hajime: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.
Kaspe, Paul E., to Prolite Plastics Limited. Method and apparatus for forming a single flange pipe adapter. 4,525,319, Cl. 264-322.000.
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, to Mitsui Petrochemical Industries Ltd. Process for producing ethylene copolymer by gaseous phase copolymerization. 4,525,547, Cl. 526-68.000.
Kato, Hideo: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.
Kato, Hidetoshi; Sada, Takeshi; Mayumi, Nobuo; and Matsuhashi, Hajime, to Nippondenso Co., Ltd. Battery charging control system for automobile. 4,525,662, Cl. 322-28.000.
Kato, Kazuo: *See—*
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.
Kato, Kiichi: *See—*
Ito, Kenichi; Musha, Tohru; Kato, Kiichi; and Yamamoto, Kimiaki, 4,525,825, Cl. 369-45.000.
Kato, Kunitoshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for operating plural poly phase A.C. motors having a common load. 4,525,656, Cl. 318-85.000.
Kato, Misao: *See—*
Shimeki, Yasuharu; Kato, Misao; Matsushima, Hiroshi; and Ishikawa, Toshiro, 4,525,753, Cl. 360-45.000.
Kato, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone forming system. 4,524,666, Cl. 84-1.030.
Kato, Shigeru: *See—*
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,525,824, Cl. 369-45.000.
Kato, Tiharu: *See—*
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.
Kato, Toshimi: *See—*
Okawa, Susumu; Matsui, Hideaki; Jufuku, Yasunobu; and Kato, Toshimi, 4,525,160, Cl. 474-242.000.
Kato, Tsuyoshi: *See—*
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.
Kato, Yukiteru; and Watanabe, Kazuhiro, to Lotte Co., Ltd. Coated frozen-dessert and a process for preparation thereof. 4,525,365, Cl. 426-101.000.
Katsaros, Arthur T.: *See—*
Woodward, Donald W.; Katsaros, Arthur T.; and Rowles, Howard C., 4,525,187, Cl. 62-31.000.
Katsma, William L.: *See—*
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Katto, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for inverter. 4,525,660, Cl. 318-798.000.
Kaufmann, Heinrich; and Brenner, Friedhelm, to Develop Dr. Eisbein GmbH & Co. Guide path for transfer of sheets to a fixing apparatus of a copying machine. 4,525,057, Cl. 355-3.0FU.
Kawabe, Kiyoshi: *See—*
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, 4,525,555, Cl. 526-125.000.
Kawabe, Tadashi: *See—*
Tanaka, Minoru; and Kawabe, Tadashi, 4,525,335, Cl. 423-344.000.
Kawada, Mitsuru: *See—*
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,525,361, Cl. 514-689.000.
Kawai, Kiyoshi: *See—*
Kawai, Kyosuke; Nakagawa, Mitsuru; Yanase, Shinji; and Kawai, Kiyoshi, 4,525,190, Cl. 65-14.000.
Kawai, Kyosuke; Nakagawa, Mitsuru; Yanase, Shinji; and Kawai, Kiyoshi, to Japan Inorganic Material Co., Ltd. Apparatus for producing glass fibers with centrifugal force. 4,525,190, Cl. 65-14.000.
Kawakami, Yasuo, to Pioneer Electronic Corporation. Device for generating a tuning frequency set command signal of a tuner system. 4,525,864, Cl. 455-160.000.
Kawamura, Hideo; Sagawa, Nobukazu; and Yamamoto, Noriyoshi, to Isuzu Motor, Ltd.; and Kyoto Ceramic Co., Ltd. Ceramic glow plug. 4,525,622, Cl. 219-270.000.
Kawana, Akio: *See—*
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,525,027, Cl. 350-96.300.
Kawasaki, Katsuyuki: *See—*
Tanaka, Hideki; Kamimura, Masanori; Horikawa, Koji; and Kawasaki, Katsuyuki, 4,525,158, Cl. 474-167.000.
Kawashima, Hirofumi, to Seiko Instruments & Electronics, Ltd. Flexural mode vibrator formed of lithium tantalate. 4,525,646, Cl. 310-360.000.
Kawashima, Kazue, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas insulated switch. 4,525,612, Cl. 200-147.00R.
Kawatani, Masafumi: *See—*
Maeda, Kiyoshi; and Kawatani, Masafumi, 4,525,749, Cl. 358-290.000.
Kaye, Gordon E.; and Agnello, Joseph A., Jr., to Univention Incorporated. Position actuated illuminated gunsight. 4,524,534, Cl. 42-1.00S.
Keem, John E.; and Marshall, Gerald F., to Energy Conversion Devices, Inc. Point source X-ray focusing device. 4,525,853, Cl. 378-84.000.
Keene Corporation: *See—*
Harriman, Robert W., 4,525,595, Cl. 174-35.0GC.
Kefalas A/S: *See—*
Perregaard, Jens K., 4,525,360, Cl. 514-277.000.
Kelley, Robert E.; and Prince, David. Device for cleaning teeth and orthodontal braces. 4,524,790, Cl. 132-84.00R.
Kelly, David R., to Professional Chemical & Color, Inc. Method of treating polyaramid fiber. 4,525,168, Cl. 8-130.100.
Kelman, Charles D. Intraocular lenses. 4,524,468, Cl. 603-6.000.
Kemp, Richard A.: *See—*
Heilman, William J.; and Kemp, Richard A., 4,525,557, Cl. 526-128.000.
Kemper, Kyran B.; and Rubin, Harvey, to AT&T Bell Laboratories. Programmable network tester with data formatter. 4,525,789, Cl. 364-481.000.
Kemper, Reinhard: *See—*
Lotsch, Wolfgang; Kemper, Reinhard; and Schefczik, Ernst, 4,525,591, Cl. 544-250.000.
Kempton, Calvin E.: *See—*
Kenyon, Richard L.; and Kempton, Calvin E., 4,524,906, Cl. 236-12.110.
Kendall Company, The: *See—*
Van Overloop, Ronald R., 4,525,091, Cl. 401-134.000.
Kennecott Corporation: *See—*
Boecker, Wolfgang D. G.; and Hailey, Laurence N., 4,525,461, Cl. 501-90.000.
Kaiser, Gregory A.; DeMunda, Gabriel P.; and Tressler, Richard E., 4,525,429, Cl. 428-566.000.
Kenyon, Richard L.; and Kempton, Calvin E., to Parker-Hannifin Corporation. Temperature control valve and sensor/controller therefor. 4,524,906, Cl. 236-12.110.
Kershaw, Robert: *See—*
Soled, Stuart L.; Wold, Aaron; and Kershaw, Robert, 4,525,206, Cl. 75-0.5BA.

Ketcham, Russell S.: *See—*
Bulka, Raymond I.; Ketcham, Russell S.; and Mak, Kelvin K., 4,525,118, Cl. 414-43.000.
Ketner, Eugene N. Timepiece having central opening. 4,525,077, Cl. 368-77.000.
Keyes, Richard E.; and Dirksing, John W., to Finn Corporation. Dispersing machine for large bales. 4,524,916, Cl. 241-101.00A.
Khalil, Ezzat N.; and Cheslow, Ernest, to Johnson Products Co., Inc. Hair relaxer. 4,524,787, Cl. 132-7.000.
Khramov, Rem A.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.
Kidawara, Atsushi; and Kobayashi, Kazunari, to Olympus Optical Co., Ltd. Film cassette. 4,524,920, Cl. 242-71.100.
Kienzle Apparate GmbH: *See—*
Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, 4,524,804, Cl. 137-625.640.
Kikuchi, Katsutoshi: *See—*
Ohsaki, Kozo; Kikuchi, Katsutoshi; and Hirota, Yoshitsugu, 4,525,482, Cl. 518-707.000.
Kim, Sang K., to Oh, Myung Keun; and Poong San Metal Corp. Tricycles. 4,524,987, Cl. 280-204.000.
Kim, Tai K.: *See—*
Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., 4,525,331, Cl. 423-54.000.
Kimberlin, Fred, Jr. Tab can opening tool. 4,524,646, Cl. 81-3.550.
Kimoto, Toshifumi: *See—*
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, 4,525,723, Cl. 346-74.400.
Kimpara, Masaomi; and Suzuki, Munehiro, to American Cyanamid Company. Aqueous-soluble compositions for adjusting growth of ornamental and crop plants. 4,525,200, Cl. 71-76.000.
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, to Nittan Company, Ltd. Fire alarm system. 4,525,700, Cl. 340-518.000.
Kindler, Robert I.: *See—*
Dennison, William G.; Horr, Kenneth R.; and Kindler, Robert I., 4,525,694, Cl. 335-132.000.
King-Seeley Thermos Company: *See—*
Spinner, Joseph R., 4,525,073, Cl. 366-323.000.
Kingston, Richard L.: *See—*
Benusa, John E.; and Kingston, Richard L., 4,525,156, Cl. 604-28.000.
Kinney David J. Vacuum finger harvester for strawberries or the like. 4,524,573, Cl. 56-330.000.
Kino, Jirou; and Uemura, Toshirou, to Hitachi, Ltd. Regulated AC-DC converter having saturation inductance in resonant circuit. 4,525,774, Cl. 363-17.000.
Kinoshita, Kunio; and Kokaji, Norio, to Iwatsu Electric Co., Ltd. Method and apparatus for forming magnetic latent images. 4,525,725, Cl. 346-74.500.
Kiraly, Robert L.: *See—*
Wright, Dale M.; and Kiraly, Robert L., 4,524,620, Cl. 73-587.000.
Kirby, Michael D.; and Mazzeo, Michael P., to Essex Specialty Products, Inc. Method and compositions for improving bonding to painted surfaces. 4,525,511, Cl. 524-158.000.
Kirk, William A.: *See—*
Fundom, Danny L.; and Kirk, William A., 4,524,879, Cl. 220-273.000.
Kishida, Kunio: *See—*
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,525,434, Cl. 428-674.000.
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N. Composition for preventing deposition of inorganic salts. 4,525,293, Cl. 252-181.000.
Kisioka, Kazuya; and Yamakoshi, Kenichi, to Ueda Electronic Works Limited. Automatic, continuous and indirect blood pressure measurement apparatus. 4,524,777, Cl. 128-677.000.
Kita, Kazunori, to Casio Computer Co., Ltd. Electronic wristwatch with printer function. 4,525,075, Cl. 368-10.000.
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro. Flexible tying member for theftproof device. 4,525,702, Cl. 340-556.000.
Kitahara, Shizuo; and Sugi, Nagatoshi, to Nippon Zeon Co. Ltd. Method for modifying rubbers. 4,525,541, Cl. 525-337.000.
Kitajima, Goro : *See—*
Nemoto, Shigeru; Saitou, Sinichi; Kitajima, Goro ; and Osada, Hazime, 4,525,760, Cl. 360-137.000.
Kitamura, Mitsuhiro; Mito, Ikuo; and Kobayashi, Kohroh, to Nippon Electric Co., Ltd. Double channel planar buried heterostructure laser. 4,525,841, Cl. 372-48.000.
Kitamura, Yoichiro: *See—*
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, 4,525,712, Cl. 340-825.310.
Kitaue, Masaaki: *See—*
Akamatsu, Osamu; and Kitaue, Masaaki, 4,525,611, Cl. 200-83.00R.
Kiyomiya, Tadashi: *See—*
Nakane, Yasuaki; Akamatsu, Junichi; Sakamoto, Susumu; and Kiyomiya, Tadashi, 4,525,412, Cl. 428-199.000.
Klebanoff, Steven L., to Ruskin Manufacturing Company. Damper with integral support. 4,524,678, Cl. 98-1.000.
Klee, David J.; and Ehnot, Donald J., to Air Products and Chemicals, Inc. Continuous deflashing system. 4,524,548, Cl. 51-322.000.
Klee, David J.: *See—*
Burke, Thomas W.; and Klee, David J., 4,524,550, Cl. 51-424.000.
Klee, Howard W., Jr., to Chevron Research Company. Method for removal of hydrogen sulfide. 4,525,338, Cl. 423-573.00G.
Klein, Hans-Jorg; and Bohmer, Herbert, to Kraftwerk Union Aktiengesellschaft. Case for accommodating written material for presentation purposes. 4,524,867, Cl. 206-232.000.
Klein, Henri: *See—*
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.
Klinger, Max H. Receptacle for containing disposable cloths and a stick-like container. 4,524,871, Cl. 206-233.000.
Klockner-Becorit GmbH: *See—*
Gotte, Elmar; and Schulte, Heinrich, 4,524,859, Cl. 198-735.000.
Knifton, John F.: *See—*
Lin, Jiang-Jen; and Knifton, John F., 4,525,481, Cl. 518-700.000.
Knischka, Paul O.; and Grenz, Hans J., to Knischka Rubine Gesellschaft m.b.H. Gradient process of growing crystals from liquid media. 4,525,171, Cl. 23-300.000.
Knischka Rubine Gesellschaft m.b.H: *See—*
Knischka, Paul O.; and Grenz, Hans J., 4,525,171, Cl. 23-300.000.
Knoll, William C.; and Bay, David L., to GTE Products Corporation. Drive scheme for a plurality of flourescent lamps. 4,525,649, Cl. 315-96.000.
Knudtson, Lynn A.; and Sprenger, Glenn R., to Stauffer Chemical Company. In line dry material sampler. 4,524,628, Cl. 73-863.430.
Kobayashi, Hisashi: *See—*
Snyder, William J.; Miller, Raymond H.; and Kobayashi, Hisashi, 4,525,138, Cl. 431-187.000.
Kobayashi, Kazunari: *See—*
Kidawara, Atsushi; and Kobayashi, Kazunari, 4,524,920, Cl. 242-71.100.
Kobayashi, Kohroh: *See—*
Kitamura, Mitsuhiro; Mito, Ikuo; and Kobayashi, Kohroh, 4,525,841, Cl. 372-48.000.
Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Brake booster. 4,524,584, Cl. 60-554.000.
Kobayashi, Minoru, to Olympus Optical Company Limited. Transcriber with erasing device. 4,525,761, Cl. 360-137.000.
Kobayashi, Seishichi; Miyazawa, Tetsuo; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Process for producing epoxy-type-lacquer. 4,525,497, Cl. 523-400.000.
Kobayashi, Shigeru; and Nakamura, Munehiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing modified polyolefin particles and foamed article made from the particles. 4,525,486, Cl. 521-59.000.
Koch, Wolfgang: *See—*
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; and Heitz, Walter, 4,525,579, Cl. 528-388.000.
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Hybrid magnetic bubble memory device. 4,525,808, Cl. 365-36.000.
Koguchi, Shigeo: *See—*
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.
Kohashi, Tadao; Irie, Hiroyuki; Ide, Susumu; and Esaki, Hiroshi, to Matsushita Electric Industrial Company, Limited. Electroosmotic ink printer. 4,525,727, Cl. 346-140.00R.
Kohl, Charles F., to Dow Corning Corporation. Catalyst compositions for preparing polyorganosiloxanes. 4,525,470, Cl. 502-167.000.
Kohl, Wilhelm: *See—*
Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Kohl, Wilhelm, 4,525,197, Cl. 71-11.000.
Kohler, Manfred R.: *See—*
ten Broeke, Klaas E.; and Kohler, Manfred R., 4,524,874, Cl. 212-197.000.
Kohno, Tadashi: *See—*
Shimizu, Takahiko; Fukui, Hishao; and Kohno, Tadashi, 4,525,092, Cl. 401-265.000.
Koike, Shinkichi: *See—*
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, 4,525,209, Cl. 75-51.500.
Kojima, Hiroaki: *See—*
Narisawa, Shigeyuki; Funaki, Masahiko; Kojima, Hiroaki; and Kuga, Kazuhiko, 4,525,491, Cl. 521-174.000.
Kojima, Shigezo: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.
Kokaji, Norio: *See—*
Kinoshita, Kunio; and Kokaji, Norio, 4,525,725, Cl. 346-74.500.
Kokubo, Shozo: *See—*
Toda, Shozo; Yasuda, Kenji; and Kokubo, Shozo, 4,525,276, Cl. 210-433.200.
Kolb, Alfred. Projection table for an optical projection pattern grinding machine. 4,524,521, Cl. 33-1.0AA.
Koller, Otto: *See—*
Pochmarski, Luzian; Koller, Otto; and Abendstein, Karl, 4,525,211, Cl. 75-58.000.
Kollmeyer, Willy D.; and Brown, Thomas L., to Shell Oil Company. Oxaspiro alkane and alkene ether herbicides. 4,525,201, Cl. 71-76.000.

Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, to Hitachi, Ltd.; and Pioneer Electronic Corp. Variable electronic impedance circuit. 4,525,636, Cl. 307-264.000.

Komiyama, Makoto: *See—*
Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, 4,525,180, Cl. 55-37.000.

Komori Printing Machinery Co., Ltd.: *See—*
Ito, Kiyoshi, 4,524,712, Cl. 118-46.000.
Omori, Tamotsu, 4,524,690, Cl. 101-148.000.
Suzuki, Yosihide, 4,524,961, Cl. 270-4.000.

Komova, Svetlana N.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Kondo, Shinichi: *See—*
Umezawa, Hamao; Takeuchi, Tomio; and Kondo, Shinichi, 4,525,299, Cl. 260-112.50R.

Kondo, Toshihiko: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.

Konecny, James W., to Thorsen Tool Company. Ratchet wrench of the socket drive type with socket ejector. 4,524,653, Cl. 81-63.000.

Konig, Klaus: *See—*
Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, 4,525,590, Cl. 544-222.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,525,056, Cl. 355-3.0DD.

Konno, Kunio: *See—*
Nakamura, Soichi; and Konno, Kunio, 4,525,744, Cl. 358-224.000.

Konomi, Toshiaki; and Ishiyama, Shinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of determining fluctuations in indicated mean effective pressure of engine and apparatus therefor. 4,525,781, Cl. 364-431.010.

Konter, Wolfgang: *See—*
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, 4,525,561, Cl. 526-220.000.

Koog, Wolfgang; and Estabrook, Lawrence E., to Texaco Inc. Preheating and deslagging a gasifier. 4,525,176, Cl. 48-197.00R.

Koomen, Pieter C. Dual blade windshield wiper. 4,524,481, Cl. 15-250.410.

Kordomenos, Panagiotis I., to Ford Motor Company. Thermosetting coating composition. 4,525,569, Cl. 528-73.000.

Korman, Nathaniel I., to Ventures Research & Development Group. Selective color modification. 4,525,736, Cl. 358-28.000.

Korobochkin, Valery P.: *See—*
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.

Koshinaka, Eiichi: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.

Kosonen, Vaino J.: *See—*
Willus, Charles A.; Kosonen, Vaino J.; and Sanchez, Dale R., 4,525,274, Cl. 210-232.000.

Kostansek, Edward C., to Engelhard Corporation. Chalking-resistant, calcined kaolin clay pigment and method of making. 4,525,518, Cl. 524-447.000.

Kostelezky, Walter: *See—*
Wohlfarth, Dieter; and Kostelezky, Walter, 4,525,782, Cl. 364-431.010.

Kosuge, Yutaka: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,525,702, Cl. 340-556.000.

Kosugi, Yoshinobu; and Tachibana, Kaoru, to Slik Tripod Co., Ltd. Device for fixing a camera to a tripod. 4,525,052, Cl. 354-293.000.

Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet recording head. 4,525,728, Cl. 346-140.00R.

Kouba, Daniel J.: *See—*
Boyle, David H.; and Kouba, Daniel J., 4,525,640, Cl. 307-450.000.

Kowa Company Limited: *See—*
Inagi, Toshio; Muramatsu, Toyojiro; and Nagai, Hidetaka, 4,525,347, Cl. 424-81.000.

Koyama, Toshio: *See—*
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.

Kraftwerk Union Aktiengesellschaft: *See—*
Klein, Hans-Jorg; and Bohmer, Herbert, 4,524,867, Cl. 206-232.000.

Krampe, Hubert: *See—*
Baas, Willem; Hof, Tette; Comes, Heinrich; Jaunich, Helmut; and Krampe, Hubert, 4,524,954, Cl. 266-45.000.

Krause, Werner: *See—*
Schimmel, Gunther; Heymer, Gero; Krause, Werner; and Pieper, Werner, 4,525,333, Cl. 423-112.000.

Krehel, Charles A.; and Kaniwec, George N., to Cooper Thermometer Company, The. Fuel gauge for propane tank. 4,524,617, Cl. 73-296.000.

Krempl, Peter W.; and Schindler, Wolfgang, to A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Method and device for continuous measurement of the mass of aerosol particles in gaseous samples. 4,525,627, Cl. 250-345.000.

Krenzer, Theodore J., to Gleason Works, The. Cutter and method for gear manufacture. 4,525,108, Cl. 407-22.000.

Krishnakumar, Suppayan M.: *See—*
Pocock, John F. E.; Mahajan, Gautam K.; Krishnakumar, Suppayan M.; and Friendship, Kenneth F. M., 4,525,401, Cl. 428-64.000.

Krnac, Ondrej. Wind-powered machine. 4,525,122, Cl. 416-80.000.

Krohn, Ulrich: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.

Krude, Werner; Jordan, Alfons; and Harz, Peter. Assembly for connecting together torque-transmitting members. 4,525,098, Cl. 403-280.000.

Krufka, Frank S., to RCA Corporation. System for measuring and identifying line spacing on a curved surface. 4,525,735, Cl. 358-10.000.

Krupp Stahl Aktiengesellschaft: *See—*
Dislich, Heinz; and Richter, Horst, 4,525,463, Cl. 501-99.000.

Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, to Nippon Oil Company Limited. Method for vapor phase polymerization of olefins. 4,525,548, Cl. 526-72.000.

Kubo, Tetsushi. Holder of pipes or pipe joints for welding. 4,524,959, Cl. 269-43.000.

Kubota, Hidetaka: *See—*
Mathumoto, Sigemi; Kubota, Hidetaka; and Nagoshi, Fumiya, 4,525,530, Cl. 525-84.000.

Kubota, Naohiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,525,506, Cl. 524-102.000.

Kubota, Satoshi; Nakashima, Mikito; Mogami, Takao; and Nakagawa, Tetsuo, to Kabushiki Kaisha Suwa Seikosha. Surface hard coat for a synthetic resin lens. 4,525,421, Cl. 428-412.000.

Kueny, Don F., to Outboard Marine Corporation. Outboard motor mounting assembly. 4,524,942, Cl. 248-643.000.

Kuga, Kazuhiko: *See—*
Narisawa, Shigeyuki; Funaki, Masahiko; Kojima, Hiroaki; and Kuga, Kazuhiko, 4,525,491, Cl. 521-174.000.

Kulikova, Olga A.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Kulpa, Walter J., to Pitney Bowes Inc. Envelope stacking machine. 4,524,965, Cl. 271-214.000.

Kupfer, Karl H., to U.S. Philips Corporation. Narrow-band amplifier, more specifically television intermediate frequency amplifier. 4,525,681, Cl. 330-286.000.

Kuraray Co., Ltd.: *See—*
Omura, Ikuo; and Yamauchi, Junichi, 4,525,493, Cl. 523-116.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ohya, Masaki; Matsukura, Yoshihiro; and Anzai, Mitsuru, 4,525,414, Cl. 428-213.000.

Kurihara, Kazuhiko: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.

Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, to Nippon Oil Co., Ltd. Process for producing polyolefins. 4,525,552, Cl. 526-116.000.

Kurtz, Stuart J.; and Potts, James E., to Union Carbide Corporation. Low level irradiated linear low density ethylene/alpha-olefin copolymers and film extruded therefrom. 4,525,257, Cl. 204-159.200.

Kush, Stephen T.; and Meffe, Marc E., to Sperry Corporation. Fiber optic vibration modal sensor. 4,525,626, Cl. 250-227.000.

Kusz, Maximillian, to Owens-Illinois, Inc. Tamper indicating child-resistant package. 4,524,876, Cl. 215-224.000.

Kutyanin, Leonid I.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Kutzner, Reinhard: *See—*
Heinz, Richard; and Kutzner, Reinhard, 4,525,840, Cl. 371-47.000.

Kuus, Felix: *See—*
Barron, Charles D.; and Kuus, Felix, 4,524,834, Cl. 166-385.000.

Kuwabara, Shigeyuki, to Hitachi, Ltd. Disk storage controller. 4,525,801, Cl. 364-900.000.

Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, to Hoechst Aktiengesellschaft. Process and apparatus for making phosphorus pentoxide with utilization of reaction heat. 4,525,329, Cl. 422-202.000.

Kuzanian, Armen S.: *See—*
Petrosian, Ashot G.; Bagdasarov, Khachik S.; Kuzanian, Armen S.; Ovanesian, Karine L.; and Butaeva, Tatyana I., 4,525,460, Cl. 501-86.000.

Kyoto Ceramic Co., Ltd.: *See—*
Kawamura, Hideo; Sagawa, Nobukazu; and Yamamoto, Noriyoshi, 4,525,622, Cl. 219-270.000.

Laapotti, Jorma, to Valmet Oy. Press section of a paper machine. 4,525,241, Cl. 162-301.000.

Labas, Nicholas: *See—*
Miller, Thomas M.; Schraff, Raymond J.; and Labas, Nicholas, 4,524,702, Cl. 110-173.00A.

Labaune, Gerard: *See—*
Larigaldie, Serge; and Labaune, Gerard, 4,525,140, Cl. 431-258.000.

Labib, Mohamed E.; and Poliniak, Eugene S., to RCA Corporation. High-density information disc lubricants. 4,525,402, Cl. 428-64.000.

Lagerstedt & Krantz AB: *See—*
Magnusson, Per-Erik, 4,524,469, Cl. 4-216.000.

Lai, Stephen H.; and Srivastava, Gopal K., to Zenith Electronics Corporation. Biased current mirror having minimum switching delay. 4,525,682, Cl. 330-288.000.

Laisney, Bernard; Letoffe, Michel; Perrin, Patrice; and Ulrich, Jean, to Rhone-Poulenc Specialites Chimiques. Single component organopolysiloxane compositions containing silanes with acyloxy or ketoniminoxy groups as cross linking agents and organic derivatives of titanium or zirconium as catalysts. 4,525,565, Cl. 528-17.000.

Laiterie Triballat: *See—*
Bolzer, Rene J. M.; and Clanchin, Jean, 4,525,366, Cl. 426-271.000.

Lam, Leo K.; and Phillips, Edward, to Litton Systems, Inc. Apparatus and method for laser pumping of nuclear magnetic resonance cell. 4,525,672, Cl. 324-304.000.

Lamb, Miles P.; and Karol, Herman S., to Westinghouse Electric Corp. Driving and aligning coupling. 4,525,095, Cl. 403-16.000.

Lamiral, Jean P.: *See—*
Cau, Egidio; and Lamiral, Jean P., 4,525,833, Cl. 370-99.000.

Lamont, Mary H.: *See—*
Nelson, Donald L.; and Lamont, Mary H., 4,525,544, Cl. 525-531.000.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Power assisted rotatable film wrapping apparatus. 4,524,568, Cl. 53-556.000.

Lancaster, William G.: *See—*
Lancaster, Patrick R.; and Lancaster, William G., 4,524,568, Cl. 53-556.000.

Landa, Vaclav; and Vitek, Jaromir, to Stani vyzkumny ustav materoalu. Process for the electrolytic deposition of layers of nickel alloys. 4,525,248, Cl. 204-29.000.

Lane, Thao: *See—*
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.

Lange, Horst: *See—*
Pavel, Klaus; and Lange, Horst, 4,524,815, Cl. 163-5.000.

Lange, Wolfgang; and Boer, G. J., to Akzo NV. Composite body for long-term delivery of effective substances. 4,525,340, Cl. 424-16.000.

Lanka, Richard I. Lock device for chain driven vehicles. 4,524,591, Cl. 70-236.000.

Lankford, Frank L., Jr.: *See—*
Rome, Gerald F.; and Lankford, Frank L., Jr., 4,524,952, Cl. 254-269.000.

Lanner, Michael; and Coffey, Cynthia L., to Beth Israel Hospital Association, The. Animal cage insert and convertible animal cage. 4,524,721, Cl. 119-17.000.

Lantech, Inc.: *See—*
Lancaster, Patrick R.; and Lancaster, William G., 4,524,568, Cl. 53-556.000.

Large, George B.; and Buren, Lawrence L., to Stauffer Chemical Co. Phosphonium salts of N-phosphonomethylglycine and their use as herbicides and plant growth regulants. 4,525,202, Cl. 71-86.000.

Larigaldie, Serge; and Labaune, Gerard, to Office National d'Etudes et de Recherches Aerospatiales dit O.N.E.R.A. Ignition method and igniter device for igniting carburated gaseous mixtures. 4,525,140, Cl. 431-258.000.

Lasher, Albert C.: *See—*
Formo, Jerome L.; Lasher, Albert C.; and White, Robert W., 4,524,512, Cl. 30-147.000.

Lassmann, Manfred: *See—*
Raasch, Hans; and Lassmann, Manfred, 4,524,578, Cl. 57-263.000.

Lastovsky, Rostislav P.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Laumont, Roger, to Hydroperfect International H. P. I. Electro-hydraulic unit for steering, braking, suspension and like devices for vehicles. 4,525,126, Cl. 417-310.000.

Laverman, Royce J., to Chicago Bridge & Iron Company. Thermal energy storage tank using modular heat batteries. 4,524,756, Cl. 126-400.000.

Law, Kock-Yee; and Bailey, Frank C., to Xerox Corporation. Process for squaraine compositions. 4,525,592, Cl. 564-307.000.

Lawrence, John N.; and Sandor, Istvan, to Bio-Chem Valve Corp. Pinch valve. 4,524,802, Cl. 137-595.000.

Lawson, Gustaf R., to AMP Incorporated. Electrical connector. 4,525,023, Cl. 339-258.00R.

Leach, John M. Screw-jack type accumulation conveyor. 4,524,862, Cl. 198-781.000.

Lear S.n.c. di Foggini & C.: *See—*
Foggini, Giovanni, 4,525,008, Cl. 296-97.00K.

Leavitt, Dale L.: *See—*
Dayton, Birney D.; and Leavitt, Dale L., 4,525,836, Cl. 370-67.000.

Le Berre, Serge: *See—*
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.

Leblond, Claude W., to Gerber Garment Technology, Inc. Method and apparatus for forming pattern pieces. 4,524,894, Cl. 225-2.000.

Leclerc, Pierre: *See—*
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.

Leclerc, Roland-Yves J., to Intermedicat GmbH. Rolled flexible medical suction drainage device. 4,525,166, Cl. 604-133.000.

Leco Corporation: *See—*
Bredeweg, Roger L., 4,525,328, Cl. 422-80.000.

Ledebuhr, Richard L.: *See—*
Wilde, Bernard D.; Van Ee, Gary R.; Ledebuhr, Richard L.; and Rotz, C. Alan, 4,524,572, Cl. 56-327.00R.

Lee, Donald L.: *See—*
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,525,643, Cl. 310-313.00A.

Lee, Gim F., Jr., to General Electric Company. Plasticized reinforced compositions of a polyphenylene ether resin. 4,525,508, Cl. 524-140.000.

Lee, Shy-Fuh, to Zoecon Corporation. Herbicidal compositions comprising compounds containing a phenylaminophenoxy moiety. 4,525,205, Cl. 71-108.000.

Legille, Edouard; and Mailliet, Pierre, to Paul Wurth S.A. Method of and apparatus for controllably charging a furnace. 4,525,120, Cl. 414-160.000.

Le Grives, Bernard: *See—*
Flassayer, Claude; Le Grives, Bernard; and Simon, Paul R., 4,525,238, Cl. 156-645.000.

Lehmann, Kjeld, to Danfoss A/S. Equipment box for a power converter arrangement. 4,525,769, Cl. 361-386.000.

Lehmann, Randall E.; Brehm, Gailon E.; and Seymour, David J., to Texas Instruments Incorporated. Monolithic low noise common-gate amplifier. 4,525,678, Cl. 330-277.000.

Leibinger, Berthold, to Trumpf GmbH & Co. Bottom die construction. 4,524,661, Cl. 83-690.000.

Leier, Wolfgang: *See—*
Berges, Hanns-Peter; Frieden, Peter; and Leier, Wolfgang, 4,525,129, Cl. 418-84.000.

Leih, Michael P. Security alarm arrangement. 4,525,701, Cl. 340-541.00...

Leising, Frederic, to Rhone-Poulenc Specialites Chimiques. Stable amphoteric latices of copolymers based on conjugated dienes. 4,525,519, Cl. 524-457.000.

Le Magourou, Yves, to Societe d'Exploitation des Procedes Marechal. Quick make and break plug and socket connector. 4,525,610, Cl. 200-51.130.

Lemaster, Milton R. Dehydration apparatus for printing press inking system. 4,524,689, Cl. 101-141.000.

Leno, Theodore M.: *See—*
Cardona, Ramon M.; Leno, Theodore M.; and O'Leary, Melody M., 4,525,087, Cl. 400-613.200.

Lenze GmbH & Co. KG Aerzen: *See—*
Wehrmann, Claus, 4,524,919, Cl. 242-67.10R.

Leonard, Patrick R.: *See—*
Pelletier, Charles A.; Gonso, William E., Jr.; Cameron, Douglas S.; and Leonard, Patrick R., 4,524,607, Cl. 73-40.50R.

Leonberger, Frederick J.: *See—*
Foyt, Arthur G.; Leonberger, Frederick J.; and Williamson, Richard C., 4,525,871, Cl. 455-325.000.

Le Pennec, Claude: *See—*
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,525,337, Cl. 423-449.000.

LePoire, Robert A. Adjustable jig. 4,524,960, Cl. 269-45.000.

Lerner, Elaine. Sexual aid. 4,524,760, Cl. 128-1.00R.

Les Ateliers Mecaniques Alexandre, Inc.: *See—*
Tzabanakis, George, 4,524,792, Cl. 135-90.000.

Letoffe, Michel: *See—*
Laisney, Bernard; Letoffe, Michel; Perrin, Patrice; and Ulrich, Jean, 4,525,565, Cl. 528-17.000.

Leunig, Carl V.; and Susi, Michael F., to Tex-Tech Industries. Tennis ball evaluator. 4,524,614, Cl. 73-147.000.

Le Van Mao, Raymond: *See—*
Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, 4,525,466, Cl. 502-63.000.

Levine, Peter A.: *See—*
Wood, Robert F., Jr.; Monahan, John F.; and Levine, Peter A., 4,525,743, Cl. 358-213.000.

Levine, Seymour, to Litton Systems, Inc. Apparatus and method for inertial measurement of pipeline deflection. 4,524,526, Cl. 33-312.000.

Levy, Nessim I. Carriage positioning system. 4,524,520, Cl. 33-1.00M.

Lewis, Arnold; and Hagen, Norman R. Natural appearing posterior teeth for denture plates and the like. 4,525,146, Cl. 433-198.000.

Lewis, Lloyd James: *See—*
Jeffrey, Jewell W., 4,524,527, Cl. 33-451.000.

Lewis, Norris E.: *See—*
Hohmann, Thomas C.; Lewis, Norris E.; and Miller, Michael B., 4,525,025, Cl. 350-96.150.

Leybold-Heraeus GmbH: *See—*
Berges, Hanns-Peter; Frieden, Peter; and Leier, Wolfgang, 4,525,129, Cl. 418-84.000.
Sperzel, Wolfgang; and Sturmer, Johann, 4,525,652, Cl. 315-307.000.

Leyland Vehicles Limited: *See—*
Greenwood, Christopher J., 4,524,641, Cl. 74-691.000.

LGZ Landis & Gyr Zug AG: *See—*
Lienhard, Heinz; and Petr, Jan, 4,525,668, Cl. 324-142.000.

Liang, Charles C.: *See—*
Barnette, Luverne H.; and Liang, Charles C., 4,525,440, Cl. 429-191.000.

Libbey, William J.: *See—*
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,525,322, Cl. 264-531.000.

LICENTIA Patent-Verwaltungs-GmbH: *See—*
Schenkel, Klaus D.; and Welzenbach, Manfred, 4,525,834, Cl. 370-3.000.
Scheuermann, Helmut, 4,525,844, Cl. 375-2.100.

Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,524,658, Cl. 83-152.000.

Liekens, J. Alfons F.; and Hendriks, Ivo G. M., to Teepak, Inc. Method and apparatus for packaging sheathed tubular strands. 4,524,561, Cl. 53-397.000.

Lieland, Stephen J.: *See—*
Lucas, Delbert E.; and Lieland, Stephen J., 4,524,582, Cl. 60-421.000.

Lienhard, Heinz; and Petr, Jan, to LGZ Landis & Gyr Zug AG. System for measuring electrical output or energy. 4,525,668, Cl. 324-142.000.

Liesch, Jean-Francois: *See—*
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.

Lignes Telegraphiques et Telephoniques: *See—*
Cau, Egidio; and Lamiral, Jean P., 4,525,833, Cl. 370-99.000.

Li-Jung, Hu: *See—*
Maw-Cheng, Shieh; Seng-Jung, Chen; Li-Jung, Hu; and Jin-Luh, Su, 4,525,210, Cl. 75-58.000.

Lillibridge, Herbert J.; and Schwarzmann, Russell A., to United Technologies Corporation. Intersecting feather seals for interlocking gas turbine vanes. 4,524,980, Cl. 277-199.000.

Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Acetaldehyde production from synthesis gas. 4,525,481, Cl. 518-700.000.

Lindgren, Matts J.; and Culp, Murl F., to Lockheed Missiles & Space Co., Inc. Inflation-controlled parachute. 4,524,930, Cl. 244-152.000.

Line Industry Corp.: *See—*
Matsushita, Yoshihiro, 4,524,861, Cl. 198-781.000.

Linn, Maynard W. Binding unit. 4,524,992, Cl. 281-45.000.

Linn, Michael A., to Nox-Crete Chemicals, Incorporated. Composition for waterproofing and inhibiting erosion and corrosion of silicon dioxide containing substrates. 4,525,213, Cl. 106-2.000.

Lista AG: *See—*
Dunner, Max, 4,525,012, Cl. 312-222.000.

Lister, Jerry D., to Adver-Togs, Inc. Method of and composition for producing glow printing. 4,525,295, Cl. 252-301.360.

Little, William M., Jr.: *See—*
Withers, Stanley J.; Schneiderman, Gary E.; and Little, William M., Jr., 4,524,776, Cl. 128-644.000.

Litton Industrial Products, Inc.: *See—*
Heaston, Gaylord E.; and Farazandeh, Edward A., 4,524,547, Cl. 51-165.770.

Litton Systems Inc.: *See—*
Hohmann, Thomas C.; Lewis, Norris E.; and Miller, Michael B., 4,525,025, Cl. 350-96.150.
Lam, Leo K.; and Phillips, Edward, 4,525,672, Cl. 324-304.000.
Levine, Seymour, 4,524,526, Cl. 33-312.000.
Louis, Arnold S.; and Wiener, Robert P., 4,525,698, Cl. 338-39.000.
Schwindt, Gary W., 4,525,015, Cl. 339-17.00C.

Livak, Ronald J., to Pfizer Inc. Copper-nickel-tin-cobalt spinodal alloy. 4,525,325, Cl. 420-473.000.

Lo, Grace Y.: *See—*
Tung, I u H.; Lo, Grace Y.; and Griggs, Jerald A., 4,525,532, Cl. 525-98.000.

Lockheed Electronics Co., Inc.: *See—*
Barletta, Joseph M.; and Yang, John P., 4,525,713, Cl. 340-825.540.

Lockheed Missiles & Space Co., Inc.: *See—*
Lindgren, Matts J.; and Culp, Murl F., 4,524,930, Cl. 244-152.000.

Loctite (Ireland) Ltd.: *See—*
Rooney, John M.; Woods, John; and Conway, Paul, 4,525,232, Cl. 156-273.300.
Rooney, John M.; and Conway, Paul, 4,525,553, Cl. 526-120.000.

Loe, James M.: *See—*
Wilson, David H.; and Loe, James M., 4,524,886, Cl. 222-58.000.

Loeb, Marvin P.; and Olson, Arne M., to Biotek, Inc. Wearable medication infusion system with arcuated reservoir. 4,525,164, Cl. 604-131.000.

Loftin, Royal E.: *See—*
Son, Adelina J.; and Loftin, Royal E., 4,525,285, Cl. 252-8.50M.

Logsdon, Duane D. Drain grate with adjustable weirs. 4,525,273, Cl. 210-164.000.

Longo, Jose M.: *See—*
Schmidt, Wolfgang; and Longo, Jose M., 4,524,928, Cl. 244-35.00R.

Loomis, Richard B.: *See—*
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., 4,524,796, Cl. 137-240.000.

Lopes Cardozo, Benjamin: *See—*
Admiraal, Daniel J. H.; and Lopes Cardozo, Benjamin, 4,525,856, Cl. 381-93.000.

Lorensen, William E.: *See—*
Cline, Harvey E.; Holik, Andrew S.; and Lorensen, William E., 4,525,858, Cl. 382-1.000.

Lori Corporation: *See—*
Hennessy, Thomas F., 4,524,593, Cl. 70-358.000.

Losee, David L., to Eastman Kodak Company. Patterning method for reducing hillock density in thin metal films and a structure produced thereby. 4,525,733, Cl. 357-65.000.

Lotsch, Wolfgang; Kemper, Reinhard; and Schefczik, Ernst, to BASF Aktiengesellschaft. 2,4-Dioxotetrahydropyrimido-(1,2-a)-benzimidazole substituted isoindoline dyes and their use. 4,525,591, Cl. 544-250.000.

Lotte Co., Ltd.: *See—*
Kato, Yukiteru; and Watanabe, Kazuhiro, 4,525,365, Cl. 426-101.000.

Louis, Arnold S.; and Wiener, Robert P., to Litton Systems, Inc. Pneumatic switch potentiometer. 4,525,698, Cl. 338-39.000.

Lowe, Clifford E.: *See—*
Durenec, Peter; and Lowe, Clifford E., 4,524,675, Cl. 89-41.030.

Lucas, Delbert E.; and Lieland, Stephen J., to Cincinnati Incorporated. Control system for hydraulic presses. 4,524,582, Cl. 60-421.000.

Lucas Industries Limited: *See—*
Ashman, Glynn; Winterbottom, Martin E.; and Berry, Kelvin T., 4,524,677, Cl. 92-168.000.

Lucas Industries public limited company: *See—*
Fenne, Ivor, 4,524,799, Cl. 137-516.270.

Luccarelli, Domenick, Jr.: *See—*
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred E., 4,525,364, Cl. 426-3.000.

Lucey, Leslie G. Multi-spindle automatic screw machine. 4,524,654, Cl. 82-3.000.

Ludwig Fahrmbacher-Lutz: *See—*
Fahrmbacher-Lutz, Ludwig; and Seidler, Klaus, 4,525,250, Cl. 204-58.500.

Luhr, Peter: *See—*
Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, 4,525,329, Cl. 422-202.000.

Luke, John A., to British-American Tobacco Company Limited. Method for producing tobacco smoke filters. 4,525,161, Cl. 493-42.000.

Lukhanin, Boris S.: *See—*
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.

Lumsden, Norman; and Phillips, Brian K., to Hunting Oilfield Services (UK) Limited. Pipe connector with interengagable tubular pin and tubular box members. 4,525,001, Cl. 285-328.000.

Lundberg, Robert D.: *See—*
Turner, S. Richard; Walker, Thad O.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,525,522, Cl. 524-547.000.

Lundeen, Allan J.: *See—*
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., 4,525,322, Cl. 264-531.000.

Lunden, Bertil, to Molnlycke AB. Holder for paper roll with central dispensing of the paper. 4,524,895, Cl. 225-19.000.

Lundh, Karl-Erik: *See—*
Danielson, Carl O.; Gustafsson, Bo B.; Richardsson, Gote E.; and Lundh, Karl-Erik, 4,524,880, Cl. 220-288.000.

Lungu, Corneliu, to Robert Bosch GmbH. Solenoid valve. 4,524,797, Cl. 137-343.000.

L'Universite de Bordeaux 1: *See—*
Vidalin, Jacques; and Aucouturier, Jean L., 4,525,803, Cl. 364-900.000.

Lurssen, Klaus: *See—*
Holmwood, Graham; and Lurssen, Klaus, 4,525,204, Cl. 71-92.000.

Luther, Hans: *See—*
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Lydtin, Hans: *See—*
Hubner, Horst; Lydtin, Hans; Rehder, Ludwig; and Zaengel, Thomas, 4,525,379, Cl. 427-53.100.

Lynham, Thomas F.; and Curtis, Lee J. Adjustable length flexible handle. 4,524,483, Cl. 16-114.00R.

Lynn, Michael E., to Marley Tile A.G. Polymer-modified cement mortars and concretes and processes for the production thereof. 4,525,500, Cl. 524-5.000.

Lynn, Michael M.; and Howells, Richard D., to Minnesota Mining and Manufacturing Company. Fluorochemical copolymers and ovenable paperboard and textile fibers treated therewith. 4,525,423, Cl. 428-421.000.

Lyons, Harold W., to Whelen Engineering Co., Inc. Air valve. 4,524,679, Cl. 98-40.020.

Machinefabriek G.J. Nijhuis B.V.: *See—*
Goossens, Jan B. R., 4,524,487, Cl. 17-1.00E.

Mack, Joel: *See—*
Bardin, Roland; Mack, Joel; and Counioux, Jean-Jacques, 4,525,327, Cl. 420-565.000.

Mack, Mark P.; and Shannon, Mark L., to Du Pont de Nemours, E. I., and Company. Olefin polymerization catalyst. 4,525,468, Cl. 502-104.000.

MacPherson, Edwin J.: *See—*
Rastall, Mary H.; Ng, Norman H.; and MacPherson, Edwin J., 4,525,492, Cl. 521-181.000.

MAD Computer, Inc.: *See—*
Yurchenco, James R.; and Nuttall, Michael J., 4,524,940, Cl. 248-359.000.

Maeda, Hirofumi; Nakamura, Kyoichi; and Fukui, Hisatoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pre-expanding process and apparatus for the same. 4,525,485, Cl. 521-58.000.

Maeda, Kiyoshi; and Kawatani, Masafumi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and apparatus for scanning an object by using the light. 4,525,749, Cl. 358-290.000.

Maeda, Takeshi: *See—*
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.

Magnasco, Enrico; and Viale, Giorgio, to Colgate-Palmolive Company. Apparatus for the selection, metering and delivery of liquids, in particular treatment liquids for industrial laundry washers. 4,524,801, Cl. 137-567.000.

Magnin, Joel: *See—*
Jouve, Hubert; and Magnin, Joel, 4,525,807, Cl. 365-36.000.

Magnusson, Per-Erik, to Lagerstedt & Krantz AB. Combined fan and valve. 4,524,469, Cl. 4-216.000.

Mahajan, Gautam K.: *See—*
Pocock, John F. E.; Mahajan, Gautam K.; Krishnakumar, Suppayan M.; and Friendship, Kenneth F. M., 4,525,401, Cl. 428-64.000.

Maida, Osamu: *See—*
Sano, Yoshiaki; Tsuchiya, Chikara; and Maida, Osamu, 4,525,637, Cl. 307-350.000.

Mailliet, Pierre: *See—*
Legille, Edouard; and Mailliet, Pierre, 4,525,120, Cl. 414-160.000.

Majefski, Richard L., to Rockwell International Corporation. Auto-equalizer apparatus. 4,525,684, Cl. 330-304.000.

Mak, Kelvin K.: *See—*
Bulka, Raymond I.; Ketcham, Russell S.; and Mak, Kelvin K., 4,525,118, Cl. 414-43.000.

Mak, Randall L.; and Young, Larry W. Corn harvester machine with mechanism for picking up downed cornstalks and retrieving ears therefrom. 4,524,571, Cl. 56-98.000.

Makino, Shoji: *See—*
Aoki, Akihiro; Hiratsuka, Shozaburo; Yamaguchi, Norihisa; and Makino, Shoji, 4,525,384, Cl. 427-174.000.

Makishima, Hideo: *See—*
Matsushita, Toshihiko; Morishita, Sadao; and Makishima, Hideo, 4,525,428, Cl. 428-488.100.

Malchert, Arthur F., Sr. Barbless fishhook. 4,524,537, Cl. 43-36.000.

Mallalieu, David H.; Apostola, Samuel N.; and DeVries, Douglas C., to Hyde Mfg. Co. Combination of a tool and a hollow tool sectional handle. 4,524,514, Cl. 30-169.000.

Malvern Scale Company: *See—*
Stuart, James M., 4,524,840, Cl. 177-210.00C.

Mangold, Hans; Eckert, Hans; and Schonborn, Jurgen, to Grundig E.M.V. Television set. 4,525,746, Cl. 358-254.000.

Mannava, Seetha R.; and Erkes, Joseph W., to General Electric Company. Torque measurement method and apparatus. 4,525,068, Cl. 356-35.500.

Mannesmann Rexroth GmbH: *See—*
Mucheyer, Norbert; and Schulte, Heinz, 4,524,945, Cl. 251-75.000.

Manresa, Inc.: *See—*
Vaillancourt, Vincent L., 4,525,157, Cl. 604-52.000.
Vaillancourt, Vincent L., 4,525,374, Cl. 427-2.000.

Manriquez, Ralph F.: *See—*
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,524,719, Cl. 118-719.000.

Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz. Power operated separable beds and support therefor. 4,524,471, Cl. 5-8.000.

Mansouri, Masoud N.: *See—*
Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz, 4,524,471, Cl. 5-8.000.

MAPA - Societa Per Azioni: *See—*
Patelli, Ferruccio, 4,524,567, Cl. 53-552.000.

Marcenac, Philippe: *See—*
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.

Marconi Company Limited, The: *See—*
Crowther, Paul A., 4,525,816, Cl. 367-123.000.

Marhofer, Gerd: *See—*
Buck, Robert; Friedrich, Michael B.; Gesthuysen, Hans D.; and Marhofer, Gerd, 4,525,699, Cl. 340-512.000.

Marien, August M.: *See—*
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., 4,525,446, Cl. 430-117.000.

Mark Products Incorporated: *See—*
Woodall, James C., 4,525,814, Cl. 367-20.000.

Markovich, Voya: *See—*
Alpaugh, Warren A.; Amelio, William J.; Markovich, Voya; and Sambucetti, Carlos J., 4,525,390, Cl. 427-305.000.

Marks, Joel S. Squeeze-ratchet tool assembly. 4,524,650, Cl. 81-57.390.

Marley Cooling Tower Company, The: *See—*
McGowan, Joseph L., 4,524,873, Cl. 212-177.000.

Marley Tile A.G.: *See—*
Lynn, Michael E., 4,525,500, Cl. 524-5.000.

Marmon Group, Inc., The: *See—*
Bione, Angelo A.; and Bagus, Brian M., 4,524,665, Cl. 84-1.010.

Marshall, Charles W.: *See—*
Parker, Samuel S.; Marshall, Charles W.; and Money, Durward G., 4,524,683, Cl. 100-3.000.

Marshall, Gerald F.: *See—*
Keem, John E.; and Marshall, Gerald F., 4,525,853, Cl. 378-84.000.

Marshall, Hubert T., II: *See—*
Curran, Paul F.; and Marshall, Hubert T., II, 4,524,615, Cl. 73-181.000.

Marshall, Jay K.: *See—*
Holberton, Philip M.; Randall, Bruce E.; and Marshall, Jay K., 4,525,669, Cl. 324-142.000.

Marshall, John; and Clark, Henry B., Jr. Set-back thermostat assembly. 4,524,908, Cl. 236-46.00R.

Marson Corporation: *See—*
Todisco, Joseph, 4,525,235, Cl. 156-511.000.

Martin, Brian, to Johnson & Johnson Dental Products Company. Photopolymerizable composition including catalyst comprising diketone plus 4-(N,N-dimethylamino)benzoic acid or ester thereof. 4,525,256, Cl. 204-159.180.

Martin, Pierre M.: *See—*
Jeanrat, Roger G.; Martin, Pierre M.; and Hardy, Georjes, 4,524,680, Cl. 99-277.100.

Martinovich, Robert J.: *See—*
Garcia, Rodrigo A.; and Martinovich, Robert J., 4,525,516, Cl. 524-380.000.

Marts, Maynard W.: *See—*
Barnes, Pierre D.; and Marts, Maynard W., 4,524,947, Cl. 251-129.000.

Maruhashi, Shigeaki: *See—*
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, 4,525,209, Cl. 75-51.500.

Maruyama, Seiichiro: *See—*
Ohmura, Yasuhiro; Maruyama, Seiichiro; and Shigemoto, Shigeru, 4,525,529, Cl. 525-64.000.

Marvin Glass & Associates: *See—*
Hanson, Steven P.; and Breslow, Jeffrey D., 4,524,967, Cl. 273-1.0GE.

Marzy, Otto: *See—*
Blaimschein, Gottfried; and Marzy, Otto, 4,525,112, Cl. 409-199.000.

Masaaki, Nagashima. Underwater bearing protection device. 4,524,977, Cl. 277-3.000.

Mason, Charles D.: *See—*
Hochberg, Arie; Haylock, John C.; and Mason, Charles D., 4,525,513, Cl. 524-288.000.

Massachusetts Computer Corporation: *See—*
Cane, David A., 4,525,778, Cl. 364-200.000.

Massachusetts Institute of Technology: *See—*
Foyt, Arthur G.; Leonberger, Frederick J.; and Williamson, Richard C., 4,525,871, Cl. 455-325.000.

Masse , Lionel; and Boisvert, Richard L. Vault. 4,524,904, Cl. 232-7.000.

Master Pitching Machine, Inc.: *See—*
Giovagnoli, Paul S., 4,524,749, Cl. 124-7.000.

Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory and method of producing the same. 4,525,811, Cl. 365-154.000.

Materials Research Corporation: *See—*
Class, Walter H.; Hurwitt, Steven D.; and Hill, Michael L., 4,525,262, Cl. 204-192.00R.

Mates, Edward I.: *See—*
Fecik, Michael T.; Ewing, John J.; and Mates, Edward I., 4,525,196, Cl. 65-287.000.

Mathumoto, Sigemi; Kubota, Hidetaka; and Nagoshi, Fumiya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin compositions. 4,525,530, Cl. 525-84.000.

Matoba, Gensuke: *See—*
Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, 4,525,520, Cl. 524-512.000.

Matra AG: *See—*
Fanti, Hansruedi, 4,524,473, Cl. 5-481.000.

Matsubara, Norio: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.

Matsuhashi, Hajime: *See—*
Kato, Hidetoshi; Sada, Takeshi; Mayumi, Nobuo; and Matsuhashi, Hajime, 4,525,662, Cl. 322-28.000.

Matsui, Hideaki: *See—*
Okawa, Susumu; Matsui, Hideaki; Jufuku, Yasunobu; and Kato, Toshimi, 4,525,160, Cl. 474-242.000.

Matsui, Masao; Okamoto, Kazuo; and Naruse, Tutomu, to Kanebo, Ltd.; and Kanebo Synthetic Fibers, Ltd. Pile articles with attenuated upper portion and a method for producing the same. 4,525,404, Cl. 428-92.000.

Matsukura, Yoshihiro: *See—*
Ohya, Masaki; Matsukura, Yoshihiro; and Anzai, Mitsuru, 4,525,414, Cl. 428-213.000.

Matsumoto, Akio; and Yokota, Mitsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Pressure responsive pump control system having an alarm lamp. 4,525,125, Cl. 417-44.000.

Matsumoto, Akio; and Yamada, Takao, to Matsushita Electric Co., Ltd. Timer apparatus. 4,525,609, Cl. 200-38.00R.

Matsumura, Hiromu: *See—*
Narisada, Masayuki; Watanabe, Fumihiko; Okada, Tetsuo; and Matsumura, Hiromu, 4,525,355, Cl. 514-210.000.

Matsushima, Hiroshi: *See—*
Shimeki, Yasuharu; Kato, Misao; Matsushima, Hiroshi; and Ishikawa, Toshiro, 4,525,753, Cl. 360-45.000.

Matsushita Electric Co., Ltd.: *See—*
Matsumoto, Akio; and Yamada, Takao, 4,525,609, Cl. 200-38.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hara, Yoshihumi; Takano, Hiroji; Kabashima, Shoshi; and Hasegawa, Mikio, 4,524,507, Cl. 29-564.200.
Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, 4,525,757, Cl. 360-130.240.
Kohashi, Tadao; Irie, Hiroyuki; Ide, Susumu; and Esaki, Hiroshi, 4,525,727, Cl. 346-140.00R.
Misawa, Yoshihiko; Seno, Makito; and Fujiwara, Koji, 4,524,860, Cl. 198-740.000.
Nakagawa, Koichiro; Suyama, Satoshi; Yanagi, Masahiro; and Nakajima, Yasutaka, 4,525,758, Cl. 360-133.000.
Nakase, Hiromi; Gotoh, Yasuhiro; and Ozawa, Kuniichi, 4,525,657, Cl. 318-254.000.
Shimeki, Yasuharu; Kato, Misao; Matsushima, Hiroshi; and Ishikawa, Toshiro, 4,525,753, Cl. 360-45.000.
Tomioka, Mitsuharu; and Imajima, Mitsuhiro, 4,525,137, Cl. 431-76.000.
Matsushita, Toshihiko; Morishita, Sadao; and Makishima, Hideo, to Mitsubishi Paper Mills, Ltd. Process for producing multicolor heat-transfer recording paper. 4,525,428, Cl. 428-488.100.
Matsushita, Yoshihiro, to Tsubakimoto Machinery & Engineering Co., Ltd.; and Line Industry Corp. Conveyor driving roller. 4,524,861, Cl. 198-781.000.
Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,525,552, Cl. 526-116.000.
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, 4,525,555, Cl. 526-125.000.
Matsuura, Norio. Golf tee. 4,524,974, Cl. 273-207.000.
Matteson, Donald S.; and Sadhu, Kizhakethil M., to Washington State University Research Foundation, Inc. Lewis acid catalysis of the homologation of boronic esters with haloalkylmetal reagents. 4,525,309, Cl. 260-462.00C.
Matusik, Frank J.: *See*—
Fitzgerald, J. Vincent; Matusik, Frank J.; and Nelson, Donald W., 4,524,610, Cl. 73-54.000.
Maul, Michael K.: *See*—
Eldumiati, Ismail I.; and Maul, Michael K., 4,525,776, Cl. 364-200.000.
Mauser, Richard J., to Ampat/Midwest Corp. Simulated structural gasket. 4,524,978, Cl. 277-189.000.
Mavilor Systemes S.A.: *See*—
Ziegler, Rolf; and Hauk, Peter, 4,524,643, Cl. 74-801.000.
Maw-Cheng, Shieh; Seng-Jung, Chen; Li-Jung, Hu; and Jin-Luh, Su, to China Steel Corporation. Si contained ferroalloy addition as a weak pre-deoxidation process in steelmaking. 4,525,210, Cl. 75-58.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften: *See*—
Claussen, Nils; Ruhle, Manfred; and Petzow, Gunter, 4,525,464, Cl. 501-103.000.
Max Widenmann Armaturenfabrik: *See*—
Ebert, Karl, 4,524,997, Cl. 285-74.000.
Maxey, Carl W. Edger transport and position apparatus. 4,524,858, Cl. 198-434.000.
Mayor Pharmaceutical Laboratories, Inc.: *See*—
Deihl, Joseph A., 4,525,341, Cl. 424-43.000.
Mayumi, Nobuo: *See*—
Kato, Hidetoshi; Sada, Takeshi; Mayumi, Nobuo; and Matsuhashi, Hajime, 4,525,662, Cl. 322-28.000.
Mazda Motor Corporation: *See*—
Kanazawa, Hirotaka, 4,524,842, Cl. 180-132.000.
Tanaka, Hideki; Kamimura, Masanori; Horikawa, Koji; and Kawasaki, Katsuyuki, 4,525,158, Cl. 474-167.000.
Mazer Corporation, The: *See*—
Panken, Irving, 4,525,214, Cl. 106-19.000.
Mazzeo, Michael P.: *See*—
Kirby, Michael D.; and Mazzeo, Michael P., 4,525,511, Cl. 524-158.000.
McAuliffe, Lawrence, Jr.; and Chauvin, Richard, to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,524,743, Cl. 123-438.000.
McCain Manufacturing Corporation: *See*—
Bulka, Raymond I.; Ketcham, Russell S.; and Mak, Kelvin K., 4,525,118, Cl. 414-43.000.
McCann, John C. Mineral separating process and apparatus. 4,525,270, Cl. 209-44.000.
McCracken, William G., Jr.: *See*—
Hetzel, Frederick; and McCracken, William G., Jr., 4,525,230, Cl. 156-179.000.
McFiggans, Robert B.: *See*—
Soderberg, John H.; Eckert, Alton B.; and McFiggans, Robert B., 4,525,785, Cl. 364-464.000.
McGowan, Joseph L., to Marley Cooling Tower Company, The. Method and apparatus for disassembling sectional boom of tower crane at terminal heights. 4,524,873, Cl. 212-177.000.
McGregor, Charles K.: *See*—
Barnich, Richard G.; Ferguson, Michael H.; and McGregor, Charles K., 4,525,601, Cl. 179-7.0MM.
McGregor, Walter; and Troutman, Richard C., to Ethicon Inc., a part interest. Multiple curved surgical needle. 4,524,771, Cl. 128-339.000.
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., to United States of America, Energy. Method for synthesizing N_2O_5. 4,525,252, Cl. 204-101.000.
McHenry, Robert J.; and Ryan, Martin A., to American Can Company. Apparatus for making a multi-layer injection blow molded container. 4,525,134, Cl. 425-130.000.
McIntyre, Robert W.: *See*—
Groom, James S.; and McIntyre, Robert W., 4,524,564, Cl. 53-449.000.
McKenna, Quentin M. Collapsible wind propelled water craft. 4,524,709, Cl. 114-39.000.
McKinney, Linda M.; and McKinney, Osborne K., to Dow Chemical Company, The. Polyurethane backed carpet containing a non-chlorinated polymer. 4,525,405, Cl. 428-95.000.
McKinney, Osborne K.: *See*—
McKinney, Linda M.; and McKinney, Osborne K., 4,525,405, Cl. 428-95.000.
McLawhon, George B.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Gallup, Jeffrey M., 4,525,804, Cl. 364-900.000.
McMahan, William J.; and Ball, John M. Low flow calibrator. 4,524,606, Cl. 73-40.000.
McMahon, Garfield W.; and Armstrong, Bruce A., to Canada, Her Majesiy the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Underwater transducer with depth compensation. 4,524,693, Cl. 367-167.000.
McMahon, Garfield W.: *See*—
Cielo, Paolo G.; and McMahon, Garfield W., 4,525,818, Cl. 367-149.000.
McMaster, Ronald A.; and Nitschke, John S., to Glasstech, Inc. Method and apparatus for supplying cooling air in a glass sheet quench. 4,525,193, Cl. 65-114.000.
McMonagle, Rodger P., to Rogers Corporation. Microwave circuit boards and method of manufacture thereof. 4,525,247, Cl. 204-24.000.
McQueen, Daniel H.: *See*—
Bayha, Charles E.; and McQueen, Daniel H., 4,525,427, Cl. 428-458.000.
McVicker, Richard W.: *See*—
Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., 4,525,139, Cl. 431-189.000.
Mears, David F., to General Electric Company. Programmable radio. 4,525,865, Cl. 455-186.000.
Meckel, Walter: *See*—
Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, 4,525,590, Cl. 544-222.000.
MED Products, Inc.: *See*—
Hayes, Daniel F.; Sias, Robert G.; Chesney, Lloyd; and Waldron, John W., 4,525,253, Cl. 204-149.000.
Meek, Thomas, to Norwood Industries, Inc. Apparatus for recording and playing back magnetic tape cassettes and the like. 4,525,755, Cl. 360-63.000.
Meeker, Donald J.: *See*—
Bangerter, Roger O.; and Meeker, Donald J., 4,525,323, Cl. 376-106.000.
Meffe, Marc E.: *See*—
Kush, Stephen T.; and Meffe, Marc E., 4,525,626, Cl. 250-227.000.
Megadiamond Industries, Inc.: *See*—
Hall, David R., 4,525,178, Cl. 51-309.000.
Meguro, Takashi; Ogata, Yasunobu; and Sawada, Yoshizo, to Hitachi Metals, Ltd. Method of heat-treating amorphous material. 4,525,222, Cl. 148-121.000.
Mehesch, Hans: *See*—
Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans, 4,525,103, Cl. 405-261.000.
Meier, Urs: *See*—
Hanseler, Urs; Meier, Urs; and Muther, Franz, 4,525,771, Cl. 361-413.000.
Melai, Henri A. I.: *See*—
De Bijl, Adrianus M. J.; and Melai, Henri A. I., 4,525,648, Cl. 315-224.000.
Merck & Co., Inc.: *See*—
Amato, Joseph S.; Karady, Sandor; and Weinstock, Leonard M., 4,525,582, Cl. 534-558.000.
Merz, Joachim: *See*—
Wildermuth, Eberhard; Jansen, Dirk; Burkhardt, Rudolf; and Merz, Joachim, 4,525,717, Cl. 343-452.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Prochaska, Wolfgang; and Schulz, Ralf-Thilo, 4,525,005, Cl. 293-117.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Sarh, Branko; and Pasenau, Hartmut, 4,524,556, Cl. 52-807.000.
Metabi, Tsuneyo, to Minolta Camera Kabushiki Kaisha. Objective lens assembly of variable focal length having a diaphragm mechanism with adjustable aperture. 4,525,037, Cl. 350-450.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Hankel, Dirk, 4,525,207, Cl. 75-3.000.
Methode Champenoise Automatisee-M C.A. G.I.E.: *See*—
Jeanrat, Roger G.; Martin, Pierre M.; and Hardy, Georjes, 4,524,680, Cl. 99-277.100.
Meyborg, Holger: *See*—
Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, 4,525,590, Cl. 544-222.000.
Meyer, Frank; Cornely, Wolfgang; and Mehesch, Hans, to Bergwerksverband GmbH. Method of fixation of anchoring bolts in boreholes. 4,525,103, Cl. 405-261.000.
Meyers, Paul A.: *See*—
Dorman, Linneaus C.; and Meyers, Paul A., 4,525,495, Cl. 523-205.000.

Michael, Dietrich: *See—*
Bonten, Heinz; Nielinger, Werner; Michael, Dietrich; and Haupt, Heinrich, 4,525,505, Cl. 524-100.000.

Michigan Hanger Company, Inc.: *See—*
Rumble, Ray M., 4,524,934, Cl. 248-62.000.
Rumble, Ray M., 4,524,935, Cl. 248-62.000.

Micronix Partners: *See—*
Rosenberg, Lawrence M., 4,525,852, Cl. 378-34.000.

Mierzwa, Dietmar, to Andreas Stihl. Cap for a tank. 4,524,881, Cl. 220-374.000.

Mikuni Kogyo Co., Ltd.: *See—*
Tominari, Noboru; and Ishida, Takashi, 4,524,745, Cl. 123-478.000.

Milberger, Ernest C.: *See—*
Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., 4,525,471, Cl. 502-209.000.

Miles, Bernard. Sheet holder for food dispenser. 4,524,558, Cl. 53-157.000.

Miller, Curtis B., to Graphic Arts Technical Innovators, Inc. Envelope feeder for printing press with timing circuit for suction cups, feed roller and flywheel. 4,524,691, Cl. 101-232.000.

Miller, David A. B.: *See—*
Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., 4,525,687, Cl. 332-7.510.

Miller, Donald L., to Facet Enterprises, Inc. Adjustable air gap and method for electromagnetic clutch. 4,524,854, Cl. 192-84.00C.

Miller, Ernest L.: *See—*
Barnes, Johnny G.; Hooten, John A.; Hurley, Patrick J.; and Miller, Ernest L., 4,525,806, Cl. 364-900.000.

Miller, Harold E.; and Cheney, Ronald W. Knee brace. 4,524,764, Cl. 128-80.00C.

Miller, Kenneth L., to Chrysler Corporation. Fluid level sensor employing hot wire probe and digital sample and hold circuitry. 4,525,850, Cl. 377-19.000.

Miller, Michael B.: *See—*
Hohmann, Thomas C.; Lewis, Norris E.; and Miller, Michael B., 4,525,025, Cl. 350-96.150.

Miller, Nicholas E.: *See—*
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,524,719, Cl. 118-719.000.

Miller, Raymond H.: *See—*
Snyder, William J.; Miller, Raymond H.; and Kobayashi, Hisashi, 4,525,138, Cl. 431-187.000.

Miller, Stanley, to J. Stanley Miller Corporation. Apparatus for desalinating water. 4,525,243, Cl. 202-181.000.

Miller, Thomas J., to Topline Automotive Engineering Inc. Apparatus and method for engine prelubrication. 4,524,734, Cl. 123-196.00S.

Miller, Thomas M.; Schraff, Raymond J.; and Labas, Nicholas, to Eltech Systems Corporation. Readily repairable and lightweight cover for a heated vessel. 4,524,702, Cl. 110-173.00A.

Millipore Corporation: *See—*
Rising, Donald B.; and Naegeli, Richard G., Jr., 4,525,182, Cl. 55-159.000.

Mimura, Yoshiki: *See—*
Arai, Tetsuji; and Mimura, Yoshiki, 4,525,380, Cl. 427-53.100.

Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, to Adeka Argus Chemical Co., Ltd. Polyhydric alcohol ethers of 2,2,6,6-tetramethyl-4-piperidone ketals and synthetic resin compositions. 4,525,506, Cl. 524-102.000.

Minakata, Itsuo: *See—*
Ito, Osamu; Yamasaki, Harumasa; Minakata, Itsuo; and Nishizawa, Kazunori, 4,524,577, Cl. 57-200.000.

Mingrone, Frank V. Fire suppression systems. 4,524,835, Cl. 169-65.000.

Ministry of International Trade & Industry: *See—*
Yamanaka, Kazushi, 4,524,621, Cl. 73-597.000.

Minnesota Mining and Manufacturing Company: *See—*
Lynn, Michael M.; and Howells, Richard D., 4,525,423, Cl. 428-421.000.
Patel, Kalyanji U., 4,525,305, Cl. 260-401.000.
Vogelgesang, Peter J., 4,525,696, Cl. 335-272.000.

Minoh, Michihiko: *See—*
Sakai, Toshiyuki; Ohta, Yuichi; Minoh, Michihiko; and Hino, Masatoshi, 4,525,747, Cl. 358-284.000.

Minolta Camera Kabushiki Kaisha: *See—*
Metabi, Tsuneyo, 4,525,037, Cl. 350-450.000.
Tanaka, Susumu; and Takebe, Kaoru, 4,525,447, Cl. 430-122.000.

Mintz, Daniel. Ladder. 4,524,847, Cl. 182-23.000.

Miranti, Joseph P., Jr.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.

Misaki, Hideo: *See—*
Imamura, Shigeyuki; Misaki, Hideo; and Muto, Naoki, 4,525,458, Cl. 435-196.000.

Misawa, Yoshihiko; Seno, Makito; and Fujiwara, Koji, to Matsushita Electric Industrial Co., Ltd. Automatic board transfer apparatus. 4,524,860, Cl. 198-740.000.

Mitani, Kazuya: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.

Mito, Ikuo: *See—*
Kitamura, Mitsuhiro; Mito, Ikuo; and Kobayashi, Kohroh, 4,525,841, Cl. 372-48.000.

Mitsubishi Chemical Industries Limited: *See—*
Ohmura, Yasuhiro; Maruyama, Seiichiro; and Shigemoto, Shigeru, 4,525,529, Cl. 525-64.000.
Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, 4,525,554, Cl. 526-124.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kato, Kunitoshi, 4,525,656, Cl. 318-85.000.
Katto, Masayuki, 4,525,660, Cl. 318-798.000.
Matsumoto, Akio; and Yokota, Mitsuyoshi, 4,525,125, Cl. 417-44.000.
Sato, Shinichi, 4,524,508, Cl. 29-571.000.
Shiratani, Yuji, 4,525,867, Cl. 455-194.000.
Tanaka, Toshinori, 4,525,632, Cl. 290-38.00R.
Tatsumi, Takumi, 4,524,645, Cl. 74-866.000.
Yoshizumi, Toshiaki, 4,524,637, Cl. 74-569.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ide, Eizo; and Fujimura, Hiroshi, 4,525,619, Cl. 219-124.220.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,525,434, Cl. 428-674.000.

Mitsubishi Monsanto Chemical Company: *See—*
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,525,536, Cl. 525-194.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Matsushita, Toshihiko; Morishita, Sadao; and Makishima, Hideo, 4,525,428, Cl. 428-488.100.

Mitsubishi Rayon Co., Ltd.: *See—*
Inoue, Masao; Suzuki, Shingo; and Gotoh, Hajime, 4,525,029, Cl. 350-128.000.
Kamada, Kazumasa; Tamai, Katsumi; Abe, Kazunori; and Shiraishi, Yoshinobu, 4,525,537, Cl. 525-198.000.

Mitsubishi Steel Mfg. Co., Ltd.: *See—*
Yoshimura, Tsuneo, 4,524,819, Cl. 164-468.000.

Mitsui Petrochemical Industries Ltd.: *See—*
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,525,547, Cl. 526-68.000.
Ueda, Takashi; and Kashiwa, Norio, 4,525,469, Cl. 502-125.000.

Miya, Tetsuo: *See—*
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,525,027, Cl. 350-96.300.

Miyagawa, Seiichi; and Nakane, Takeshi, to Aisin Seiki Kabushiki Kaisha. Generator for generating a rotational signal in accordance with changing saturation magnetic flux density of a magnetic member. 4,525,670, Cl. 324-208.000.

Miyake, Makoto: *See—*
Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, 4,525,520, Cl. 524-512.000.

Miyamoto, Hiroshi, to Orc Manufacturing Co., Ltd. Exposure apparatus. 4,525,060, Cl. 355-53.000.

Miyao, Fumio, to Fuji Xerox Co., Ltd. Digital signal transmission system. 4,525,832, Cl. 370-85.000.

Miyao, Fumio: *See—*
Tan, Yoichi; and Miyao, Fumio, 4,525,837, Cl. 370-85.000.

Miyashita, Tetsuharu: *See—*
Sawano, Katsutoshi; and Miyashita, Tetsuharu, 4,525,667, Cl. 324-140.00R.

Miyazaki, Michio: *See—*
Nozawa, Masafumi; and Miyazaki, Michio, 4,525,839, Cl. 371-38.000.

Miyazaki, Shoichiro: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.

Miyazaki, Yasunosuke: *See—*
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,525,548, Cl. 526-72.000.

Miyazawa, Tetsuo: *See—*
Kobayashi, Seishichi; Miyazawa, Tetsuo; and Ueno, Hiroshi, 4,525,497, Cl. 523-400.000.

Miyoshi, Mitsuji: *See—*
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,525,552, Cl. 526-116.000.

Miyoshi, Mituji: *See—*
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,525,548, Cl. 526-72.000.
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, 4,525,555, Cl. 526-125.000.

Mizogui, Toyokazu: *See—*
Someya, Hiromi; Aihara, Yoshihiko; Mizogui, Toyokazu; and Suzuki, Nobuyuki, 4,525,054, Cl. 354-443.000.

Mobay Chemical Corporation: *See—*
Yeater, Robert P., 4,525,575, Cl. 528-301.000.

Mobil Oil Corporation: *See—*
Robertson, Arthur B., 4,525,395, Cl. 428-35.000.

Mogami, Takao: *See—*
Kubota, Satoshi; Nakashima, Mikito; Mogami, Takao; and Nakagawa, Tetsuo, 4,525,421, Cl. 428-412.000.

Moge , Robert A., to Rockwell International Corporation. Conveyor apparatus. 4,524,863, Cl. 198-797.000.

Moir, Ian: *See—*
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.

Molbert, John L.; and Riddle, Eddie R., to Troxler Electronic Laboratories, Inc. Radiation scatter apparatus and method. 4,525,854, Cl. 378-089.000.

Moll, Reiner; and Hornung, Armin, to Moll, Reiner. Modular framework system for furniture racks or similar articles. 4,525,093, Cl. 403-4.000.

Molnlycke AB: *See*—
Lunden, Bertil, 4,524,895, Cl. 225-19.000.

Monahan, John F.: *See*—
Wood, Robert F., Jr.; Monahan, John F.; and Levine, Peter A., 4,525,743, Cl. 358-213.000.

Monarch Marking Systems, Inc.: *See*—
Karn, Donald L., 4,524,686, Cl. 101-111.000.

Money, Durward G.: *See*—
Parker, Samuel S.; Marshall, Charles W.; and Money, Durward G., 4,524,683, Cl. 100-3.000.

Montagnon, Bernard J.; and Fanget, Bernard J. C., to Societe Anonyme dite: Institut Merueux. Process for the large-scale production of a vaccine against poliomyelitis and the resulting vaccine. 4,525,349, Cl. 424-89.000.

Montagu, Jean I.; and Pelsue, Kurt A., to General Scanning Inc. Positioner for optical element. 4,525,030, Cl. 350-255.000.

Montedison S.p.A.: *See*—
Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, 4,525,466, Cl. 502-63.000.

Montefina, S.A.: *See*—
Bertrand, Jean-Noel; and Castelein, Jean, 4,525,533, Cl. 525-98.000.

Montier, Patrick: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Montiero, Richard, to Remcut International Inc. Adjustable interior pipe cutter. 4,524,511, Cl. 30-108.000.

Moore, Milton D. Accident reconstruction device. 4,524,602, Cl. 73-9.000.

Morales, Alfredo; Galiasso, Roberto; and Carrasquel, Angel R., to Intevep, S.A. Process for catalyst preparation for the hydrodemetallization of heavy crudes and residues. 4,525,472, Cl. 502-323.000.

Moreau, Pierre A.: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, to Montedison S.p.A. Process for synthetizing zeolites having a mordenite structure and having high catalytic activity. 4,525,466, Cl. 502-63.000.

Morgner, Henry: *See*—
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, 4,524,717, Cl. 118-718.000.

Mori, Kei. Solar ray collecting device. 4,524,758, Cl. 126-440.000.

Mori, Kei. Solar light energy and electric lighting system and solar and electric light lamps used therein. 4,525,031, Cl. 350-265.000.

Mori, Kiyoto: *See*—
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.

Mori, Yoshiaki: *See*—
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, 4,525,208, Cl. 75-25.000.

Mori, Yuichirou, to Sharp Kabushiki Kaisha. Interpolation dot control in an ink jet system printer. 4,525,726, Cl. 346-75.000.

Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, to Mitsubishi Kinzoku Kabushiki Kaisha; and Fujitsu Limited. Copper alloy having high resistance to oxidation for use in leads on semiconductor devices and clad material containing said alloy. 4,525,434, Cl. 428-674.000.

Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, to Takeda Chemical Industries, Ltd. Aralkyl carboxylic acid compounds in compositions for potentiating immuno activity. 4,525,361, Cl. 514-689.000.

Morishita, Sadao: *See*—
Matsushita, Toshihiko; Morishita, Sadao; and Makishima, Hideo, 4,525,428, Cl. 428-488.100.

Morita, Hirofumi; and Hosokawa, Teruo, to Nippon Telegraph & Telephone Public Corporation. Deflective focusing system for charged particle beam. 4,525,629, Cl. 250-396.0ML.

Morita, Kiyomi: *See*—
Kashiwaya, Mineo; Morita, Kiyomi; and Sakamoto, Masahide, 4,524,739, Cl. 123-339.000.

Morizumi, Masaaki: *See*—
Takaoka, Yukio; Morizumi, Masaaki; and Takahashi, Norimichi, 4,525,046, Cl. 354-149.110.

Morrell, Robert F., Jr., to Senco Products, Inc. Reversible staple feeder shoe and door system for the magazine of a staple driving tool. 4,524,896, Cl. 227-126.000.

Morris, John C.; and Zannucci, Joseph S., to Eastman Kodak Company. Stabilized polyester compositions suitable for outdoor applications. 4,525,504, Cl. 524-99.000.

Morris, Robert C.; and Shelton, Russell S. Thermostatic fishing device. 4,524,539, Cl. 43-44.870.

Mortimer, John K., to F. F. Seeley Nominees Pty. Ltd. Carton handle. 4,524,902, Cl. 229-52.00A.

Moser, David: *See*—
Parkhurst, Warren E.; and Moser, David, 4,525,263, Cl. 204-196.000.

Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Gallup, Jeffrey M., to Halliburton Company. Interface apparatus for host computer and graphics terminal. 4,525,804, Cl. 364-900.000.

Mosko, Joseph A.: *See*—
Corzine, Robert G.; and Mosko, Joseph A., 4,525,720, Cl. 343-895.000.

Mosler, Gerhard: *See*—
Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, 4,525,570, Cl. 528-75.000.

Motohashi, Takayuki: *See*—
Kaibara, Nobuhiro; Ida, Toshio; Okuda, Shinji; and Motohashi, Takayuki, 4,524,914, Cl. 239-452.000.

Motorola, Inc.: *See*—
Boyle, David H.; and Kouba, Daniel J., 4,525,640, Cl. 307-450.000.
Dworsky, Lawrence N., 4,525,647, Cl. 310-361.000.
Freeburg, Thomas A., 4,525,861, Cl. 455-33.000.
Holden, Kirk N., 4,525,797, Cl. 364-788.000.
Jason, Barry L., 4,525,683, Cl. 330-288.000.
Parker, Norman W., 4,525,862, Cl. 455-47.000.
Rapps, Gary M.; and Feder, Alvin, 4,524,497, Cl. 29-25.350.
Richmond, Carl T.; Butler, Thomas A.; and Andrews, Joseph E., Jr., 4,525,675, Cl. 328-140.000.
Smith, Philip S.; and Gallup, Michael G., 4,525,851, Cl. 377-110.000.

MTD Products Inc.: *See*—
Ballard, Louis F., 4,524,632, Cl. 74-471.00R.

Muchel, Franz, to Carl-Zeiss-Stiftung. Optical system of variable focal and back-focal length. 4,525,042, Cl. 350-519.000.

Mucheyer, Norbert; and Schulte, Heinz, to Mannesmann Rexroth GmbH. Pressure-fluid operated limit switch. 4,524,945, Cl. 251-75.000.

Mucsy, Endre; and Hoos, Kazmer. Stand-by electrical supply source. 4,525,661, Cl. 322-4.000.

Muders, Rolf: *See*—
Horak, Otto; Falkenberg, Werner; Muders, Rolf; and Beinert, Werner, 4,525,283, Cl. 210-762.000.

Muehling, Anthony A. Continuous loop flexible saw. 4,524,519, Cl. 30-382.000.

Mueller, Christoph. Unitary resilient bearing support. 4,524,482, Cl. 16-44.000.

Mueller, Hans J., to Appleton Papers Inc. Adjustable air knife. 4,524,716, Cl. 118-665.000.

Muller, Bernard L.: *See*—
Schulte-Elte, Karl H.; and Muller, Bernard L., 4,525,298, Cl. 252-522.00R.

Muller, Dietmar, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Process and apparatus for producing single- or multi-base propellants. 4,525,313, Cl. 264-3.00B.

Muller, Rolf. Fish eye lens system. 4,525,038, Cl. 350-462.000.

Mullins, Michael J.: *See*—
Woo, Edmund P.; and Mullins, Michael J., 4,525,577, Cl. 528-327.000.

Mullis, H. Leon. Glass sight gauge for high pressure vessel. 4,524,618, Cl. 73-323.000.

Mundie, Craig J.: *See*—
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.

Munn, John W.: *See*—
Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., 4,525,139, Cl. 431-189.000.

Munn, Robin W.: *See*—
Cheresnowsky, Michael J.; Brunelli, Timothy A.; Munn, Robin W.; and Kim, Tai K., 4,525,331, Cl. 423-54.000.

Murakami, Atsushi: *See*—
Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, 4,525,554, Cl. 526-124.000.

Murakami, Tomomi, to Citizen Watch Co., Ltd. Apparatus for measuring the quantity of physical exercise. 4,525,074, Cl. 368-10.000.

Muramatsu, Toyojiro: *See*—
Inagi, Toshio; Muramatsu, Toyojiro; and Nagai, Hidetaka, 4,525,347, Cl. 424-81.000.

Murasawa, Sadao: *See*—
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, 4,525,441, Cl. 430-46.000.

Murata, Masanori; and Hayashi, Isao, to Nissan Motor Co., Ltd. Supporting structure for a floor-mounted type speed change lever. 4,524,633, Cl. 74-473.00R.

Murphy, Desmond L.; and Wimmer, Warren K., to Tektronix, Inc. Oscilloscope signal input circuit including an attenuator. 4,525,688, Cl. 333-81.00R.

Murphy, Edward J.: *See*—
Sekmakas, Kazys; and Murphy, Edward J., 4,525,543, Cl. 525-529.000.

Murphy, Peter H. Modulated forming machine. 4,524,812, Cl. 144-134.00A.

Murray, Myles N. Electrolytic capacitor and improved header therefor. 4,525,022, Cl. 339-220.00C.

Musha, Tohru: *See*—
Ito, Kenichi; Musha, Tohru; Kato, Kiichi; and Yamamoto, Kimiaki, 4,525,825, Cl. 369-45.000.

Muther, Franz: *See*—
Hanseler, Urs; Meier, Urs; and Muther, Franz, 4,525,771, Cl. 361-413.000.

Muto, Naoki: *See*—
Imamura, Shigeyuki; Misaki, Hideo; and Muto, Naoki, 4,525,458, Cl. 435-196.000.
Myers, Harold P. Burglar and intruder detection system. 4,525,047, Cl. 354-173.000.
Myers, John D. Laser device and method. 4,525,842, Cl. 372-92.000.
Myers, William C. Bingo cover dispenser. 4,524,884, Cl. 221-231.000.
Myhre, Douglas C., to Rosemount Inc. Vibration dampened beam. 4,525,081, Cl. 374-208.000.
N. Schlumberger & Cie: *See*—
Herubel, Jean-Frederic, 4,525,002, Cl. 289-2.000.
Nabisco Brands, Inc.: *See*—
D'Amelia, Ronald P.; Stroz, John J.; and White, Roy, 4,525,363, Cl. 426-3.000.
Nader, N. Joseph. Pill dispenser and method of loading. 4,524,869, Cl. 206-358.000.
Naegeli, Richard G., Jr.: *See*—
Rising, Donald B.; and Naegeli, Richard G., Jr., 4,525,182, Cl. 55-159.000.
Nagai, Hidetaka: *See*—
Inagi, Toshio; Muramatsu, Toyojiro; and Nagai, Hidetaka, 4,525,347, Cl. 424-81.000.
Nagai, Shigeo, to Nisshin Kogyo Kabushiki Kaisha. Clutch brake arrangement for farm work machinery or other equipment. 4,524,853, Cl. 192-18.00R.
Naganawa, Tadahisa: *See*—
Tomita, Tsutomu; Horio, Kimihide; and Naganawa, Tadahisa, 4,525,151, Cl. 474-101.000.
Naganuma, Yoshihiro: *See*—
Saito, Takashi; Suzuki, Kazumoto; and Naganuma, Yoshihiro, 4,525,432, Cl. 428-653.000.
Nagashima, Shigeo: *See*—
Omoda, Koichiro; Inagami, Yasuhiro; Torii, Shunichi; and Nagashima, Shigeo, 4,525,796, Cl. 364-730.000.
Nagler, Albert. Wide angle eyepiece. 4,525,035, Cl. 350-410.000.
Nagoshi, Fumiya: *See*—
Mathumoto, Sigemi; Kubota, Hidetaka; and Nagoshi, Fumiya, 4,525,530, Cl. 525-84.000.
Naito, Takayuki: *See*—
Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,525,473, Cl. 514-202.000.
Naka, Hirouki: *See*—
Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, 4,525,757, Cl. 360-130.240.
Nakagawa, Koichiro; Suyama, Satoshi; Yanagi, Masahiro; and Nakajima, Yasutaka, to Matsushita Electric Industrial Co., Ltd. Cartridge. 4,525,758, Cl. 360-133.000.
Nakagawa, Koji: *See*—
Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, 4,525,757, Cl. 360-130.240.
Nakagawa, Mitsuru: *See*—
Kawai, Kyosuke; Nakagawa, Mitsuru; Yanase, Shinji; and Kawai, Kiyoshi, 4,525,190, Cl. 65-14.000.
Nakagawa, Tetsuo: *See*—
Kubota, Satoshi; Nakashima, Mikito; Mogami, Takao; and Nakagawa, Tetsuo, 4,525,421, Cl. 428-412.000.
Nakajima, Junya; Imai, Kiyoshi; and Nakamura, Takashi, to Fuji Photo Film Company, Limited. Method of treatment of color photographic materials. 4,525,449, Cl. 430-407.000.
Nakajima, Yasutaka: *See*—
Nakagawa, Koichiro; Suyama, Satoshi; Yanagi, Masahiro; and Nakajima, Yasutaka, 4,525,758, Cl. 360-133.000.
Nakajima, Yukio: *See*—
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.
Nakamata, Hideo, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for hydraulically assembling a driven shaft and a drive member. 4,524,503, Cl. 29-407.000.
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, to Kanto Chemical Co., Inc.; and Tokyo Shibaura Denki Kabushiki Kaisha. Negative-working photoresist coating composition. 4,525,523, Cl. 524-572.000.
Nakamura, Hiroaki: *See*—
Enoki, Takashi; Nakamura, Hiroaki; and Nakashima, Fujio, 4,525,820, Cl. 369-2.000.
Nakamura, Kyoichi: *See*—
Maeda, Hirofumi; Nakamura, Kyoichi; and Fukui, Hisatoshi, 4,525,485, Cl. 521-58.000.
Nakamura, Masahiro, to Ohtake Works Company, Ltd. Method for oscillating ultrasonic waves and a microcomputer's built-in ultrasonic wave oscillator circuitry. 4,525,790, Cl. 364-484.000.
Nakamura, Masakatsu: *See*—
Takasa, Kenji; and Nakamura, Masakatsu, 4,525,396, Cl. 428-35.000.
Nakamura, Munehiro: *See*—
Kobayashi, Shigeru; and Nakamura, Munehiro, 4,525,486, Cl. 521-59.000.
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, to Hitachi, Ltd. Optical track position detecting apparatus and optical information processor using the same. 4,525,826, Cl. 369-46.000.
Nakamura, Soichi; and Konno, Kunio, to Nippon Kogaku K.K. Viewfinder optical arrangement of a camera. 4,525,744, Cl. 358-224.000.
Nakamura, Takashi: *See*—
Nakajima, Junya; Imai, Kiyoshi; and Nakamura, Takashi, 4,525,449, Cl. 430-407.000.
Nakamura, Takeaki: *See*—
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.
Nakamura, Toru, to Olympus Optical Co., Ltd. Lens system for optical recording type disks. 4,525,040, Cl. 350-480.000.
Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,525,552, Cl. 526-116.000.
Nakane, Takeshi: *See*—
Miyagawa, Seiichi; and Nakane, Takeshi, 4,525,670, Cl. 324-208.000.
Nakane, Yasuaki; Akamatsu, Junichi; Sakamoto, Susumu; and Kiyomiya, Tadashi, to Sony Corporation. Information recording medium. 4,525,412, Cl. 428-199.000.
Nakanishi, Mikihiko, to Sakura Color Products Corp. Ink composition. 4,525,216, Cl. 106-30.000.
Nakanishi, Mikihiko: *See*—
Shioi, Keiko; and Nakanishi, Mikihiko, 4,525,215, Cl. 106-22.000.
Nakanishi, Shigenori: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, 4,525,303, Cl. 260-239.55R.
Nakase, Hiromi; Gotoh, Yasuhiro; and Ozawa, Kuniichi, to Matsushita Electric Industrial Co., Ltd. Torque ripple compensation circuit for a brushless D.C. motor. 4,525,657, Cl. 318-254.000.
Nakashima, Fujio: *See*—
Enoki, Takashi; Nakamura, Hiroaki; and Nakashima, Fujio, 4,525,820, Cl. 369-2.000.
Nakashima, Mikito: *See*—
Kubota, Satoshi; Nakashima, Mikito; Mogami, Takao; and Nakagawa, Tetsuo, 4,525,421, Cl. 428-412.000.
Nakayama, Takao: *See*—
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, 4,525,441, Cl. 430-46.000.
Narayan, Thirumurti, to BASF Wyandotte Corporation. Phosphonium carboxylate catalysts for the preparation of foams characterized by isocyanurate, and/or urethane linkages. 4,525,489, Cl. 521-108.000.
Narayanan, Sarukkai R. Multi-modal educational and entertainment system. 4,525,148, Cl. 434-340.000.
Narisada, Masayuki; Watanabe, Fumihiko; Okada, Tetsuo; and Matsumura, Hiromu, to Shionogi & Co., Ltd. 7-β-Ureidoacetamidooxacephalosporins. 4,525,355, Cl. 514-210.000.
Narisawa, Shigeyuki; Funaki, Masahiko; Kojima, Hiroaki; and Kuga, Kazuhiko, to Asahi Glass Company, Ltd. Process for producing a polyurethane elastomer by reaction injection molding. 4,525,491, Cl. 521-174.000.
Narita, Yukio: *See*—
Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,525,473, Cl. 514-202.000.
Naruse, Tutomu: *See*—
Matsui, Masao; Okamoto, Kazuo; and Naruse, Tutomu, 4,525,404, Cl. 428-92.000.
National Drying Machinery Co.: *See*—
Parkes, Richard B., 4,525,370, Cl. 426-508.000.
National Gypsum Company: *See*—
Hess, Grant F., 4,524,852, Cl. 190-16.000.
National Metal and Refining Company, Ltd.: *See*—
Fitzgerald, J. Vincent; Matusik, Frank J.; and Nelson, Donald W., 4,524,610, Cl. 73-54.000.
National Research Development Corporation: *See*—
Capaccio, Giancarlo; and Ward, Ian M., 4,525,564, Cl. 526-348.100.
NCR Corporation: *See*—
Chahal, Maninderpal S.; and Therrien, Roger H., 4,525,741, Cl. 358-212.000.
Shipos, Louis E.; and Tinker, Steven I., 4,525,088, Cl. 400-621.000.
NEC Corporation: *See*—
Sato, Ikuro; and Iwata, Ryuichi, 4,525,719, Cl. 343-761.000.
Needham, Maurice E., to Hadco Corporation. Making solderable printed circuit boards. 4,525,246, Cl. 204-15.000.
Nelson, Donald L.; and Lamont, Mary H., to Dow Chemical Company, The. Vinyl ester resin composition. 4,525,544, Cl. 525-531.000.
Nelson, Donald W.: *See*—
Fitzgerald, J. Vincent; Matusik, Frank J.; and Nelson, Donald W., 4,524,610, Cl. 73-54.000.
Nelson, Eugene R.: *See*—
Bleimann, Karl R.; Fookes, Michael J.; McVicker, Richard W.; Munn, John W.; and Nelson, Eugene R., 4,525,139, Cl. 431-189.000.
Nelson Research & Development Co.: *See*—
Rajakhyaksha, Vithal J., 4,525,199, Cl. 514-788.000.
Nemoto, Shigeru; Saitou, Sinichi; Kitajima, Goro ; and Osada, Hazime, to Olympus Optical Co., Ltd. Operating lever device of a magnetic recording tape driving apparatus. 4,525,760, Cl. 360-137.000.
Nemoto, Tsuneo; and Sugawara, Kokichi, to Sony Corporation. Cassette and cassette adapter for use therewith. 4,524,926, Cl. 242-198.000.
Neppl, Franz: *See*—
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, 4,525,378, Cl. 427-38.000.
Neri, Armando: *See*—
Seragnoli, Enzo; and Neri, Armando, 4,524,784, Cl. 131-281.000.
Seragnoli, Enzo; and Neri, Armando, 4,524,785, Cl. 131-281.000.

Ness, Irving S., to Chicopee. Elastic composites. 4,525,407, Cl. 428-138.000.
Nestec S.A.: *See—*
Bengtsson, Bengt L.; Palmlin, Peter; and Ekholm, Jan, 4,525,368, Cl. 426-438.000.
NesTier Corporation: *See—*
Davis, Walter G., 4,524,723, Cl. 119-45.00R.
Netherway, David C.: *See—*
Trickey, Peter W.; Netherway, David C.; and Clifford, William S., 4,525,010, Cl. 297-216.000.
Netznik, Frederick P. Upright bicycle for handicapped. 4,524,988, Cl. 280-208.000.
Netznik, Frederick P. Adjustable molding frame. 4,525,130, Cl. 425-2.000.
Neumann, Lawrence T.; and Dissett, Walter L., to Tractech, Inc. Integral holdout ring and spring retainer for differentials. 4,524,640, Cl. 74-650.000.
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, to Bakish Materials Corp. Electron beam strip-coating apparatus. 4,524,717, Cl. 118-718.000.
New England Institute, Inc., The: *See—*
Casey, Adria C.; Adler, Alan D.; and Premuzic, Eugene T., 4,525,350, Cl. 424-94.000.
Newman, Arnold L.: *See—*
Fischell, Robert E.; Newman, Arnold L.; Riblet, Henry B.; and Powell, William R., 4,524,773, Cl. 128-419.00S.
Newton, Charles L., to Air Products and Chemicals, Inc. Dual mixed refrigerant natural gas liquefaction with staged compression. 4,525,185, Cl. 62-11.000.
Newville, Randy. Crawfish peeler. 4,524,490, Cl. 17-48.000.
Ng, Norman H.: *See—*
Rastall, Mary H.; Ng, Norman H.; and MacPherson, Edwin J., 4,525,492, Cl. 521-181.000.
NGK Insulators, Ltd.: *See—*
Abe, Shozo, 4,525,597, Cl. 174-52.0FP.
Nicholas, Mark L.: *See—*
Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., 4,525,471, Cl. 502-209.000.
Nickel, Gerhard E. B.; and Alberghini, Alfred C., to Sewell Plastics, Inc. Method of applying coating. 4,525,377, Cl. 427-12.000.
Nielinger, Werner: *See—*
Bonten, Heinz; Nielinger, Werner; Michael, Dietrich; and Haupt, Heinrich, 4,525,505, Cl. 524-100.000.
Nifco Inc.: *See—*
Sato, Youji; Omata, Nobuaki; and Shimbara, Sakuzo, 4,524,494, Cl. 24-453.000.
Tanaka, Toshie, 4,525,004, Cl. 292-171.000.
Nilsen, Arnold W. Windrow aerator. 4,524,575, Cl. 56-372.000.
Nilsson, Arne H. A., to Ingeniorsfirma N.D.C. Netzler & Dahlgren Co Aktiebolag. Device for indicating a certain proximity between movable units. 4,524,931, Cl. 246-167.00D.
Nilsson, Mary Nilsson and Goran, legal representatives: *See—*
Nilsson, Vilgot, deceased, 4,525,155, Cl. 494-3.000.
Nilsson, Vilgot, deceased (by Nilsson, Mary Nilsson and Goran, legal representatives), to Alfa-Laval Marine and Powering Engineering AB. Centrifugal separator and method of operating the same. 4,525,155, Cl. 494-3.000.
Nippon Air Brake Co., Ltd.: *See—*
Akamatsu, Osamu; and Kitaue, Masaaki, 4,525,611, Cl. 200-83.00R.
Nippon Electric Co., Ltd.: *See—*
Atobe, Masaaki; and Tagashira, Yoshimi, 4,525,676, Cl. 329-50.000.
Chiba, Fumitaka; and Shimizu, Kyozo, 4,525,809, Cl. 365-51.000.
Kage, Kouzou; and Watanabe, Hiroshi, 4,525,868, Cl. 455-206.000.
Kitamura, Mitsuhiro; Mito, Ikuo; and Kobayashi, Kohroh, 4,525,841, Cl. 372-48.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kato, Mitsumi, 4,524,666, Cl. 84-1.030.
Nonaka, Terumoto, 4,525,639, Cl. 307-446.000.
Takuya, Suzuki, 4,525,817, Cl. 367-140.000.
Tomisawa, Norio; Uchiyama, Yasuji; and Suzuki, Hideo, 4,524,668, Cl. 84-1.240.
Yamamoto, Jun; Hayashida, Hajime; and Takahashi, Hiroyoshi, 4,524,669, Cl. 84-433.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.
Nippon Kogaku K.K.: *See—*
Nakamura, Soichi; and Konno, Kunio, 4,525,744, Cl. 358-224.000.
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.
Sano, Yoshiaki; Tsuchiya, Chikara; and Maida, Osamu, 4,525,637, Cl. 307-350.000.
Shiokama, Yoshiharu; and Suzuki, Shigeru, 4,525,053, Cl. 354-400.000.
Nippon Oil Co., Ltd.: *See—*
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,525,269, Cl. 208-309.000.
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,525,548, Cl. 526-72.000.
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,525,552, Cl. 526-116.000.
Sakata, Ko; and Imai, Hirosuke, 4,525,457, Cl. 435-178.000.
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, 4,525,555, Cl. 526-125.000.
Nippon Petrochemicals, Co., Ltd.: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.
Nippon Telegraph & Telephone Public Corporation: *See—*
Kage, Kouzou; and Watanabe, Hiroshi, 4,525,868, Cl. 455-206.000.
Morita, Hirofumi; and Hosokawa, Teruo, 4,525,629, Cl. 250-396.0ML.
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,525,027, Cl. 350-96.300.
Nippon Zeon Co. Ltd.: *See—*
Kitahara, Shizuo; and Sugi, Nagatoshi, 4,525,541, Cl. 525-337.000.
Nippondenso Co., Ltd.: *See—*
Kato, Hidetoshi; Sada, Takeshi; Mayumi, Nobuo; and Matsuhashi, Hajime, 4,525,662, Cl. 322-28.000.
Nishikawa, Ikuo, to Kabushiki Kaisha Universal. Slot machine handle locking device. 4,524,636, Cl. 74-527.000.
Nishikawa, Tadashi: *See—*
Suzuki, Norio; Kajikawa, Hiroshi; and Nishikawa, Tadashi, 4,524,622, Cl. 73-620.000.
Nishikawa, Yoshinori; and Takahashi, Iwashige, to Kabushiki Kaisha Komatsu Seisakusho. Misfeed monitoring apparatus for transfer press. 4,525,706, Cl. 340-679.000.
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, to Xerox Corporation. Magnetic recording head. 4,525,723, Cl. 346-74.400.
Nishimura, Nobuo, to Fuji Xerox Company, Limited. Optical data recordation and reproduction system. 4,525,822, Cl. 369-44.000.
Nishimura, Syozi: *See—*
Tsukamoto, Takashi; Sudo, Chuzo; Aihara, Kenji; and Nishimura, Syozi, 4,525,598, Cl. 174-128.00R.
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, to Fuji Photo Film Co. Ltd. Two-dimensional solid-state image sensor device. 4,525,742, Cl. 358-213.000.
Nishizawa, Kazunori: *See—*
Ito, Osamu; Yamasaki, Harumasa; Minakata, Itsuo; and Nishizawa, Kazunori, 4,524,577, Cl. 57-200.000.
Nissan Motor Company, Limited: *See—*
Fukuhara, Hiroshige; and Fujiki, Norio, 4,525,870, Cl. 455-297.000.
Murata, Masanori; and Hayashi, Isao, 4,524,633, Cl. 74-473.00R.
Takeuchi, Kiyoshi, 4,524,625, Cl. 73-754.000.
Nisshin Kogyo Kabushiki Kaisha: *See—*
Nagai, Shigeo, 4,524,853, Cl. 192-18.00R.
Nisshin Steel Co. Ltd.: *See—*
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, 4,525,209, Cl. 75-51.500.
Nitschke, John S.: *See—*
McMaster, Ronald A.; and Nitschke, John S., 4,525,193, Cl. 65-114.000.
Nittan Company, Ltd.: *See—*
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,525,700, Cl. 340-518.000.
Nitto Boseki Co. Ltd.: *See—*
Hayashi, Ikuo; Itikawa, Tadao; Ogihara, Keizo; and Shimizu, Kiyoshi, 4,525,576, Cl. 528-313.000.
Nobutoki, Michiharu: *See—*
Arizono, Kenzo; Terasawa, Michio; and Nobutoki, Michiharu, 4,525,348, Cl. 424-81.000.
Noda, Yoichiro: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,525,702, Cl. 340-556.000.
Noguchi, Naoki: *See—*
Tanaka, Masaru; Noguchi, Naoki; Yoshino, Kenji; and Saitoh, Osamu, 4,525,069, Cl. 356-435.000.
Nohara, Saburo: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.
Nolle, Hans-Heinrich: *See—*
Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Kohl, Wilhelm, 4,525,197, Cl. 71-11.000.
Nonaka, Terumoto, to Nippon Gakki Seizo Kabushiki Kaisha. Dynamic MOS circuit block and static bipolar transistor circuit block integrated circuit device. 4,525,639, Cl. 307-446.000.
Nonnenmann, Wolfgang: *See—*
Pischke, Jurgen; and Nonnenmann, Wolfgang, 4,525,783, Cl. 364-431.110.
Norman, Edward C.; and Dowell, Howard A., to Enterra Corporation. Protection against soiling. 4,525,501, Cl. 524-28.000.
Norris, Claude R. Arc suppression device and method. 4,525,762, Cl. 361-13.000.
North American Philips Corporation: *See—*
Arora, Mulk R., 4,525,249, Cl. 204-129.750.
North American Philips Lighting Corporation: *See—*
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., 4,525,650, Cl. 315-226.000.
Norton, Robert L.: *See—*
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Norwood Industries, Inc.: *See—*
Meek, Thomas, 4,525,755, Cl. 360-63.000.

Notestein, John E.: *See—*
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., 4,524,796, Cl. 137-240.000.
Nowak, David J.; and Zupfer, David F., to R.J. LeVesque Manufacturing Co. Electrical disconnect tool. 4,525,006, Cl. 294-19.100.
Nox-Crete Chemicals, Incorporated: *See—*
Linn, Michael A., 4,525,213, Cl. 106-2.000.
Nozaki, Satoshi: *See—*
Suzuki, Migaku; Ochi, Mitsuzo; and Nozaki, Satoshi, 4,525,229, Cl. 156-161.000.
Nozawa, Masafumi; and Miyazaki, Michio, to Hitachi, Ltd. Method of controlling storage device. 4,525,839, Cl. 371-38.000.
Nuttall, Michael J.: *See—*
Yurchenco, James R.; and Nuttall, Michael J., 4,524,940, Cl. 248-359.000.
Nuvatec, Inc.: *See—*
Slavik, William H.; and Huber, William B., 4,525,163, Cl. 604-65.000.
O Tray Corporation: *See—*
Formo, Jerome L.; Lasher, Albert C.; and White, Robert W., 4,524,512, Cl. 30-147.000.
Oberg, Gary R., to Toro Company, The. Rotary cutting assembly with filament feed. 4,524,515, Cl. 30-276.000.
Obikawa, Fumito: *See—*
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.
Ochi, Mitsuzo: *See—*
Suzuki, Migaku; Ochi, Mitsuzo; and Nozaki, Satoshi, 4,525,229, Cl. 156-161.000.
Oda, Misao, to Kabushiki Kaisha Kanemitsu. Method of manufacturing sheet metal made poly-V pulleys. 4,524,595, Cl. 72-84.000.
Odermann, Charles R.: *See—*
Rodda, Donald; and Odermann, Charles R., 4,524,708, Cl. 112-231.000.
Office National d'Etudes et de Recherche Aerospatiales: *See—*
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,525,337, Cl. 423-449.000.
Office National d'Etudes et de Recherches Aerospatiales: *See—*
Ropars, Marcel; and Bloch, Bertrand, 4,525,573, Cl. 528-232.000.
Office National d'Etudes et de Recherches Aerospatiales dit O.N.E.R.A.: *See—*
Larigaldie, Serge; and Labaune, Gerard, 4,525,140, Cl. 431-258.000.
Offset Engineering, Inc.: *See—*
Jamieson, H. William, Jr., 4,524,964, Cl. 271-204.000.
Ogata, Yasunobu: *See—*
Meguro, Takashi; Ogata, Yasunobu; and Sawada, Yoshizo, 4,525,222, Cl. 148-121.000.
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, to Nippon Kogaku K.K. Motor driving device of a camera. 4,525,049, Cl. 354-173.110.
Ogawa, Nobuo: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.
Ogden, Danny W. Wrap around garment. 4,524,463, Cl. 2-105.000.
Ogihara, Keizo: *See—*
Hayashi, Ikuo; Itikawa, Tadao; Ogihara, Keizo; and Shimizu, Kiyoshi, 4,525,576, Cl. 528-313.000.
Oh, Myung Keun: *See—*
Kim, Sang K., 4,524,987, Cl. 280-204.000.
Ohashi, Kenzi: *See—*
Yamane, Toshihiro; Ohashi, Kenzi; and Sakaguchi, Toshiharu, 4,525,297, Cl. 252-511.000.
Ohashi, Saichiro, to Fuji Photo Film Co., Ltd. Photographic camera with built-in optical converter. 4,525,050, Cl. 354-195.120.
Ohaus Scale Corporation: *See—*
Scheffer, Daniel G.; Brock, Christopher W.; and Schumer, Douglas B., 4,525,794, Cl. 364-567.000.
Ohki, Hajime: *See—*
Suzuki, Hirosuke; and Ohki, Hajime, 4,525,693, Cl. 333-236.000.
Ohki, Hideo: *See—*
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.
Ohki, Nobutaka; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material comprising phenol or naphthol having sulfamoylamino group. 4,525,451, Cl. 430-551.000.
Ohkubo, Yuichi: *See—*
Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, 4,525,636, Cl. 307-264.000.
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, to Hoya Corporation. Process for producing glass product having gradient of refractive index. 4,525,189, Cl. 65-3.150.
Ohmiya, Takeo: *See—*
Taguchi, Atsushi; and Ohmiya, Takeo, 4,525,585, Cl. 536-98.000.
Ohmura, Yasuhiro; Maruyama, Seiichiro; and Shigemoto, Shigeru, to Mitsubishi Chemical Industries Limited. Polyester resin composition. 4,525,529, Cl. 525-64.000.
Ohsaki, Kozo; Kikuchi, Katsutoshi; and Hirota, Yoshitsugu, to Toyo Engineering Corporation. Process for producing a gas containing methane. 4,525,482, Cl. 518-707.000.
Ohta, Yuichi: *See—*
Sakai, Toshiyuki; Ohta, Yuichi; Minoh, Michihiko; and Hino, Masatoshi, 4,525,747, Cl. 358-284.000.
Ohtake Works Company, Ltd.: *See—*
Nakamura, Masahiro, 4,525,790, Cl. 364-484.000.
Ohya, Masaki; Matsukura, Yoshihiro; and Anzai, Mitsuru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-shrinkable composite laminate film and process for preparing the same. 4,525,414, Cl. 428-213.000.
Ojima, Yasuo: *See—*
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, 4,525,208, Cl. 75-25.000.
Okada, Mizuho: *See—*
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, 4,525,441, Cl. 430-46.000.
Okada, Tetsuo: *See—*
Narisada, Masayuki; Watanabe, Fumihiko; Okada, Tetsuo; and Matsumura, Hiromu, 4,525,355, Cl. 514-210.000.
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, to Nippon Petrochemicals, Co., Ltd.; and Polymer Processing Research Institute Ltd. Method and apparatus for stretching film or fibrous web. 4,525,317, Cl. 264-235.800.
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, to Nippon Telegraph & Telephone Public Corp. Single mode optical fibers. 4,525,027, Cl. 350-96.300.
Okamoto, Kazuo: *See—*
Matsui, Masao; Okamoto, Kazuo; and Naruse, Tutomu, 4,525,404, Cl. 428-92.000.
Okamoto, Miyoshi: *See—*
Higuchi, Akira; and Okamoto, Miyoshi, 4,525,169, Cl. 8-485.000.
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, to Hitachi, Ltd. Transaction processing system. 4,525,712, Cl. 340-825.310.
Okawa, Susumu; Matsui, Hideaki; Jufuku, Yasunobu; and Kato, Toshimi, to Toyota Jidosha Kabushiki Kaisha. Endless belt member for a continuously variable transmission. 4,525,160, Cl. 474-242.000.
Okawa, Tamotsu; and Yuasa, Hiromi, to Omron Tateisi Electronics Co. Electronic cash register. 4,525,799, Cl. 364-900.000.
Oki, Toshiro, to ORC Manufacturing Co., Ltd. Combination of a plate for exposure and frame plates. 4,525,061, Cl. 355-72.000.
Okitsu, Kiyoshi: *See—*
Watanabe, Shoji; and Okitsu, Kiyoshi, 4,525,258, Cl. 204-159.230.
Okuda, Shinji: *See—*
Kaibara, Nobuhiro; Ida, Toshio; Okuda, Shinji; and Motohashi, Takayuki, 4,524,914, Cl. 239-452.000.
Okuma, Yasuo: *See—*
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, 4,525,712, Cl. 340-825.310.
Okumura, Jun: *See—*
Aburaki, Shimpei; Kamachi, Hajime; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,525,473, Cl. 514-202.000.
Okumura, Norio: *See—*
Imai, Fusao; and Okumura, Norio, 4,525,420, Cl. 428-372.000.
Olapinski, Hans: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.
O'Leary, Melody M.: *See—*
Cardona, Ramon M.; Leno, Theodore M.; and O'Leary, Melody M., 4,525,087, Cl. 400-613.200.
Olin Corporation: *See—*
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,525,422, Cl. 428-418.000.
Oliver, Larry R.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.
Olson, Arne M.: *See—*
Loeb, Marvin P.; and Olson, Arne M., 4,525,164, Cl. 604-131.000.
Olympus Optical Co., Ltd.: *See—*
Hattori, Shinichiro; Hosoda, Seiichi; and Takamatsu, Takeshi, 4,524,761, Cl. 128-6.000.
Ito, Kenichi; Musha, Tohru; Kato, Kiichi; and Yamamoto, Kimiaki, 4,525,825, Cl. 369-45.000.
Kidawara, Atsushi; and Kobayashi, Kazunari, 4,524,920, Cl. 242-71.100.
Kobayashi, Minoru, 4,525,761, Cl. 360-137.000.
Nakamura, Toru, 4,525,040, Cl. 350-480.000.
Nemoto, Shigeru; Saitou, Sinichi; Kitajima, Goro ; and Osada, Hazime, 4,525,760, Cl. 360-137.000.
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.
Omata, Nobuaki: *See—*
Sato, Youji; Omata, Nobuaki; and Shimbara, Sakuzo, 4,524,494, Cl. 24-453.000.
Omnes, Jacqueline: *See—*
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,525,337, Cl. 423-449.000.
Omoda, Koichiro; Inagami, Yasuhiro; Torii, Shunichi; and Nagashima, Shigeo, to Hitachi, Ltd. Pipelined operation unit for vector data. 4,525,796, Cl. 364-730.000.
Omori, Tamotsu, to Komori Printing Machinery Co., Ltd. Water supply apparatus for printing press. 4,524,690, Cl. 101-148.000.
Omron Tateisi Electronics Co.: *See—*
Okawa, Tamotsu; and Yuasa, Hiromi, 4,525,799, Cl. 364-900.000.
Omura, Ikuo; and Yamauchi, Junichi, to Kuraray Co., Ltd. Highly water-resistant adhesive. 4,525,493, Cl. 523-116.000.

Ono, Chikai: *See*—
Toyoda, Kazuhiro; and Ono, Chikai, 4,525,812, Cl. 365-155.000.
Ono, Sadao: *See*—
Hamada, Masanori; and Ono, Sadao, 4,525,869, Cl. 455-277.000.
Orandi, Ahmad. Endoscope injection needle. 4,524,770, Cl. 128-303.100.
Orban Associates, Inc.: *See*—
Orban, Robert A., 4,525,857, Cl. 381-100.000.
Orban, Robert A., to Orban Associates, Inc. Crossover network. 4,525,857, Cl. 381-100.000.
Orc Manufacturing Co., Ltd.: *See*—
Miyamoto, Hiroshi, 4,525,060, Cl. 355-53.000.
Oki, Toshiro, 4,525,061, Cl. 355-72.000.
Orton, Edward: *See*—
Weinstein, Boris; and Orton, Edward, 4,525,540, Cl. 525-327.200.
Osada, Hazime: *See*—
Nemoto, Shigeru; Saitou, Sinichi; Kitajima, Goro ; and Osada, Hazime, 4,525,760, Cl. 360-137.000.
Oshima, Shigeru: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,525,048, Cl. 354-173.100.
Wong, Wan C.; and Oshima, Shigeru, 4,525,051, Cl. 354-203.000.
Osterloh, Rolf: *See*—
Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, 4,525,570, Cl. 528-75.000.
Ostlinning, Edgar: *See*—
Idel, Karsten; Ostlinning, Edgar; Koch, Wolfgang; and Heitz, Walter, 4,525,579, Cl. 528-388.000.
Ostlund, Gunnar, to Aktiebolaget Svenskt Mjolsocker. Concentric filter elements. 4,525,275, Cl. 210-323.200.
Oswald, Heinz: *See*—
Feusi, Markus; Huber, Josef; Oswald, Heinz; and Pfyffer, Peter, 4,524,918, Cl. 242-18.00A.
Ota, Tadashi, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal compound and compositions containing same. 4,525,033, Cl. 350-350.00R.
Otaki, Sakashi: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,525,824, Cl. 369-45.000.
Otani, Tadashi: *See*—
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.
Otis Engineering Corporation: *See*—
Hilts, Robert L.; and Crow, Robert W., 4,524,833, Cl. 166-381.000.
Williams, Charles R., 4,524,830, Cl. 166-321.000.
Otsubo, Yoshiaki: *See*—
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, 4,525,300, Cl. 260-112.50R.
Ouest Standard Telematique: *See*—
Cohen, Albert E.; Hance, William G.; Moir, Ian; Lane, Thao; and Caussarieu, Frederic, 4,525,830, Cl. 370-60.000.
Outboard Marine Corporation: *See*—
Broughton, George L.; Higby, Jeffrey P.; and Young, Robert F., 4,525,149, Cl. 440-1.000.
Kueny, Don F., 4,524,942, Cl. 248-643.000.
Ovanesian, Karine L.: *See*—
Petrosian, Ashot G.; Bagdasarov, Khachik S.; Kuzanian, Armen S.; Ovanesian, Karine L.; and Butaeva, Tatyana I., 4,525,460, Cl. 501-86.000.
Owen, Thomas E.: *See*—
Shirley, Donald J.; and Owen, Thomas E., 4,525,645, Cl. 310-337.000.
Owens-Illinois, Inc.: *See*—
Kusz, Maximillian, 4,524,876, Cl. 215-224.000.
Oyama, Yasuyoshi: *See*—
Okano, Yoshio; Okuma, Yasuo; Aizawa, Kuniomi; Oyama, Yasuyoshi; and Kitamura, Yoichiro, 4,525,712, Cl. 340-825.310.
Oyo Corporation, U.S.A.: *See*—
Hefer, Fred W., 4,525,819, Cl. 367-188.000.
Ozaki, Kiyomi; and Tsunoda, Kikuo, to Ryobi Ltd. Fishing reel. 4,524,921, Cl. 242-84.10J.
Ozaki, Kiyomi: *See*—
Tunoda, Kikuo; and Ozaki, Kiyomi, 4,524,923, Cl. 242-84.50A.
Ozawa, Kuniichi: *See*—
Nakase, Hiromi; Gotoh, Yasuhiro; and Ozawa, Kuniichi, 4,525,657, Cl. 318-254.000.
Ozeki, Isamu. Hanger attachment. 4,524,892, Cl. 224-256.000.
Pabst, Mark W.; and Handy, Richard L., to Iowa State University Research Foundation, Inc. Soil effective stress sensor and method of using same. 4,524,626, Cl. 73-784.000.
Pacific Metals & Co. Ltd.: *See*—
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, 4,525,209, Cl. 75-51.500.
Package Machinery Company: *See*—
Groom, James S.; and McIntyre, Robert W., 4,524,564, Cl. 53-449.000.
Padovan, Mario: *See*—
Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, 4,525,466, Cl. 502-63.000.
Page, Matthew A.; Libbey, William J.; and Lundeen, Allan J., to Du Pont de Nemours, E. I., and Company. Ethylene polymer composition for blow molding. 4,525,322, Cl. 264-531.000.
Pall Corporation: *See*—
Cordes, Harry D.; Haberer, Thomas G.; and Verrando, Marcel G., III, 4,525,183, Cl. 55-179.000.
Silverwater, Bernard, 4,524,793, Cl. 137-198.000.
Palm, Bengt N. J.: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,524,732, Cl. 123-193.00H.
Palm, Lars-Erik, to Tetra Pak International AB. Packing container for pressurized contents and a method for manufacturing the same. 4,524,565, Cl. 229-449.000.
Palmer, Richard C.: *See*—
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Palmlin, Peter: *See*—
Bengtsson, Bengt L.; Palmlin, Peter; and Ekholm, Jan, 4,525,368, Cl. 426-438.000.
Pampus, Gottfried: *See*—
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, 4,525,561, Cl. 526-220.000.
Pan, Jing-Jong; and Wilson, John B., to Harris Corporation. Microwave/millimeter wave amplifier with RF feedback. 4,525,680, Cl. 330-277.000.
Panavision, Inc.: *See*—
Fazekas, Carl F., 4,525,045, Cl. 352-57.000.
Panken, Irving, to Mazer Corporation, The. Crayon adapted for development of latent images. 4,525,214, Cl. 106-19.000.
Pantalone, Antonio. Section-iron for braces or uprights for lattice girders and like structures. 4,524,555, Cl. 52-738.000.
Paradyne Corporation: *See*—
Bremer, Gordon; Betts, William L.; and Greene, Robert T., 4,525,846, Cl. 375-39.000.
Bremer, Gordon, 4,525,847, Cl. 375-59.000.
Parikh, Kamal I.: *See*—
Simmons, Nathaniel; and Parikh, Kamal I., 4,525,831, Cl. 370-63.000.
Parker-Hannifin Corporation: *See*—
Kenyon, Richard L.; and Kempton, Calvin E., 4,524,906, Cl. 236-12.110.
Sheng, Shih Y.; and York, Ray A., 4,525,695, Cl. 335-262.000.
Parker, Norman W., to Motorola, Inc. Transform modulation system. 4,525,862, Cl. 455-47.000.
Parker, Samuel S.; Marshall, Charles W.; and Money, Durward G., to Parker Tobacco Company, Inc. Method of improving the handling of tobacco. 4,524,683, Cl. 100-3.000.
Parker Tobacco Company, Inc.: *See*—
Parker, Samuel S.; Marshall, Charles W.; and Money, Durward G., 4,524,683, Cl. 100-3.000.
Parkes, Richard B., to National Drying Machinery Co. Water type blancher. 4,525,370, Cl. 426-508.000.
Parkhurst, Warren E.; and Moser, David. Method for cleaning a corrosion protection anode. 4,525,263, Cl. 204-196.000.
Pasco, Robert W.: *See*—
Schwarz, James A.; and Pasco, Robert W., 4,525,734, Cl. 357-67.000.
Pasenau, Hartmut: *See*—
Sarh, Branko; and Pasenau, Hartmut, 4,524,556, Cl. 52-807.000.
Pate, Harold T.; and Fochler, Helmut P., to Indian Head Inc. Flexible conduit system. 4,524,999, Cl. 285-158.000.
Patel, Arvind D., to Dresser Industries, Inc. Thermally stable drilling fluid additive. 4,525,562, Cl. 526-271.000.
Patel, Arvind M., to International Business Machines Corporation. Multibyte error correcting system involving a two-level code structure. 4,525,838, Cl. 371-37.000.
Patel, Kalyanji U., to Minnesota Mining and Manufacturing Company. Leather with fluorochemical finish. 4,525,305, Cl. 260-401.000.
Patelli, Ferruccio, to MAPA - Societa Per Azioni. Machine for making, filling and sealing bags. 4,524,567, Cl. 53-552.000.
Patil, Arvind S.; Bantjes, John H.; Pepoy, Louis J.; and Sappok, Reinhard J., to BASF Wyandotte Corporation. Process for preparing ferriferrocyanide pigments. 4,525,217, Cl. 106-304.000.
Patil, Suresh S.: *See*—
Birch, Robert G.; and Patil, Suresh S., 4,525,354, Cl. 424-115.000.
Paul-Heinz Wagner: *See*—
Dubiel, Oswald; Hirtsiefer, Karl-Richard; and Wagner, Paul-Heinz, 4,524,651, Cl. 81-57.390.
Paul Wurth S.A.: *See*—
Legille, Edouard; and Mailliet, Pierre, 4,525,120, Cl. 414-160.000.
Pauldine, Donald D. Hair roller. 4,524,788, Cl. 132-42.00R.
Pavel, Klaus; and Lange, Horst, to Rhein-Nadel Maschinennadel Gesellschaft mit beschrankter Haftung. Method of producing sewing machine needles. 4,524,815, Cl. 163-5.000.
Pavia, Michael R.: *See*—
Butler, Donald E.; Hershenson, Fred M.; and Pavia, Michael R., 4,525,476, Cl. 514-326.000.
Pavlick, Michael J., to Budd Company, The. Low level freight car for carrying trailers. 4,524,699, Cl. 105-4.00R.
Payne, George B.; and Powell, James E., to Shell Oil Company. ((3,4,5,6-Tetrahydro-2H-pyran-2-yl)methoxy)oxabicycloalkane herbicides. 4,525,203, Cl. 71-88.000.
PD Giftware Designs, Inc.: *See*—
DiCostanzo, Pam, 4,525,393, Cl. 428-7.000.
Pearson, Ernest J., to Chloride Group Public Limited Company. Recombination multicell electric storage battery. 4,525,438, Cl. 429-149.000.

Pearson, Richard K.: *See—*
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,525,252, Cl. 204-101.000.
Peascoe, Warren J.: *See—*
Ahnemiller, James; and Peascoe, Warren J., 4,525,487, Cl. 521-78.000.
Peck, Anthony F., to Britax Vega Limited. Vehicle lamp assembly. 4,525,772, Cl. 362-290.000.
Peckels, Jean: *See—*
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.
Pecorari, John G.: *See—*
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Pedersen, James R., to General Electric Company. Trimetallic bearings. 4,525,083, Cl. 384-278.000.
Peerless Nuclear Corporation: *See—*
Di Noia, Emanuel J.; and Breunich, Theodore R., 4,524,624, Cl. 73-708.000.
Pehrson, John V., to Reno Energy Systems, Inc. Scraper with dual-direction blade tilt control. 4,524,836, Cl. 172-4.500.
Peiffer, Dennis G.: *See—*
Turner, S. Richard; Walker, Thad O.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,525,522, Cl. 524-547.000.
Peignier, Michel; and Renault, Claude, to Rhone-Poulenc Specialites Chimiques. Storage-stable, pumpable concentrated suspensions of water-soluble polymers. 4,525,515, Cl. 524-378.000.
Pelletier, Charles A.; Gonso, William E., Jr.; Cameron, Douglas S.; and Leonard, Patrick R., to Science Applications International Corporation. System and method for locating leaking tubes. 4,524,607, Cl. 73-40.50R.
Pelsue, Kurt A.: *See—*
Montagu, Jean I.; and Pelsue, Kurt A., 4,525,030, Cl. 350-255.000.
Penn Lithographics, Inc.: *See—*
Davenport, Harold D.; and DeVito, Anthony J., 4,524,962, Cl. 270-21.100.
Pennwalt Corporation: *See—*
Sanchez, Jose, 4,525,308, Cl. 260-453.0RZ.
Pentel Kabushiki Kaisha: *See—*
Shimizu, Takahiko; Fukui, Hishao; and Kohno, Tadashi, 4,525,092, Cl. 401-265.000.
Pepoy, Louis J.: *See—*
Patil, Arvind S.; Bantjes, John H.; Pepoy, Louis J.; and Sappok, Reinhard J., 4,525,217, Cl. 106-304.000.
Perbet, Jean-Noel: *See—*
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.
Hareng, Michel; Perbet, Jean-Noel; and Defrance, Michel, 4,525,709, Cl. 340-719.000.
Perfection Automotive Products Corp.: *See—*
Bloom, Stephen R., 4,524,480, Cl. 15-159.00A.
Perlstein, Jerome H.: *See—*
Detty, Michael R.; and Perlstein, Jerome H., 4,525,443, Cl. 430-83.000.
Perregaard, Jens K., to Kefalas A/S. Anti-psychotic phenylindene derivatives and acid addition salts thereof. 4,525,360, Cl. 514-277.000.
Perretta, Frederick A., to United Technologies Corporation. Clamping circuit board guides. 4,525,770, Cl. 361-399.000.
Perrigo, Stephen M. Low frequency speaker enclosure. 4,524,845, Cl. 181-152.000.
Perrin, Patrice: *See—*
Laisney, Bernard; Letoffe, Michel; Perrin, Patrice; and Ulrich, Jean, 4,525,565, Cl. 528-17.000.
Perrone, John J.: *See—*
Zawadzki, Stanley C., Jr.; Stadelmaier, Robert A.; and Perrone, John J., 4,525,100, Cl. 405-129.000.
Perry, Patricia, to Butterick Company, Inc. Fitting curve and ruler. 4,524,522, Cl. 33-11.000.
Persson, Ingemar. Apparatus for production of hot tap water. 4,524,909, Cl. 237-2.00B.
Peter, Hans: *See—*
Brugger, Manfred; Janczer, Peter; and Peter, Hans, 4,524,817, Cl. 164-290.000.
Peterat, Michael: *See—*
Griesshammer, Rudolf; and Peterat, Michael, 4,525,336, Cl. 423-348.000.
Petersen, Kurt E., to Transensory Devices, Inc. Method and apparatus for forming hermetically sealed electrical feedthrough conductors. 4,525,766, Cl. 361-283.000.
Petersen, Thomas D. Surgical knee alignment method and system. 4,524,766, Cl. 128-92.00H.
Peterson, William D., II. Belt conveyor gap stringer support system. 4,524,864, Cl. 198-828.000.
Petr, Jan: *See—*
Lienhard, Heinz; and Petr, Jan, 4,525,668, Cl. 324-142.000.
Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,525,296, Cl. 252-391.000.
Petrosian, Ashot G.; Bagdasarov, Khachik S.; Kuzanian, Armen S.; Ovanesian, Karine L.; and Butaeva, Tatyana I. Single-crystal material based on aluminium garnets. 4,525,460, Cl. 501-86.000.
Petzow, Gunter: *See—*
Claussen, Nils; Ruhle, Manfred; and Petzow, Gunter, 4,525,464, Cl. 501-103.000.
Pfaff Industriemaschinen GmbH: *See—*
Sander, Wilfried, 4,524,707, Cl. 112-152.000.
Willenbacher, Erich, 4,524,703, Cl. 112-098.000.
Pfeffer, Martin: *See—*
Horowitz, Franklin B.; Pfeffer, Martin; and Hertanu, Herold T., 4,525,071, Cl. 366-152.000.
Pfizer Inc.: *See—*
Livak, Ronald J., 4,525,325, Cl. 420-473.000.
Pfuderer, Horst: *See—*
Bender, Rolf; Jacob, Werner; and Pfuderer, Horst, 4,524,671, Cl. 89-14.050.
Pfyffer, Peter: *See—*
Feusi, Markus; Huber, Josef; Oswald, Heinz; and Pfyffer, Peter, 4,524,918, Cl. 242-18.00A.
Phan, Xuan T.; and Shannon, Paul J., to Armstrong World Industries, Inc. Acrylate and methacrylate polymers and processes for preparing them. 4,525,302, Cl. 260-239.30R.
Pharmacia AB: *See—*
Danielson, Carl O.; Gustafsson, Bo B.; Richardsson, Gote E.; and Lundh, Karl-Erik, 4,524,880, Cl. 220-288.000.
Phillips, Ann L.: *See—*
Phillips, Roger W.; and Phillips, Ann L., 4,524,953, Cl. 256-23.000.
Phillips, Brian K.: *See—*
Lumsden, Norman; and Phillips, Brian K., 4,525,001, Cl. 285-328.000.
Phillips, Edward: *See—*
Lam, Leo K.; and Phillips, Edward, 4,525,672, Cl. 324-304.000.
Phillips, Raymond J., to United States of America, Navy. Demountable coaxial electrical connector for in-line amplifiers. 4,525,013, Cl. 339-7.000.
Phillips, Roger W.; and Phillips, Ann L. Adjustable protective rope barrier. 4,524,953, Cl. 256-23.000.
Pichot, Michel: *See—*
Guillaume, Michel; and Pichot, Michel, 4,525,066, Cl. 356-43.000.
Pickelman, Dale M.: *See—*
Wessling, Ritchie A.; and Pickelman, Dale M., 4,525,526, Cl. 524-815.000.
Pieper, Werner: *See—*
Schimmel, Gunther; Heymer, Gero; Krause, Werner; and Pieper, Werner, 4,525,333, Cl. 423-112.000.
Pierrat, Michel A. Counterweight for orbital drive mechanism. 4,524,644, Cl. 74-804.000.
Pietryka, Joseph, to Fives-Cail Babcock. Replacement apparatus for guide roll segment in a curved guide rack of a continuous casting installation. 4,524,818, Cl. 164-448.000.
Piezoelectric Technology Investors, Limited: *See—*
Staudte, Juergen H., 4,524,619, Cl. 73-505.000.
Pikula, Robert D.: *See—*
Saxby, Willard A.; and Pikula, Robert D., 4,524,877, Cl. 215-228.000.
Pilache, Michel: *See—*
Filderman, Rene ; and Pilache, Michel, 4,525,159, Cl. 474-201.000.
Pilat, Boris V.: *See—*
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.
Pioneer Electronic Corporation: *See—*
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,525,824, Cl. 369-45.000.
Kawakami, Yasuo, 4,525,864, Cl. 455-160.000.
Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, 4,525,636, Cl. 307-264.000.
Piotroski, Peter N.: *See—*
Gottlieb, Robert K.; and Piotroski, Peter N., 4,525,788, Cl. 364-478.000.
Pischke, Jurgen; and Nonnenmann, Wolfgang, to Robert Bosch GmbH. Method and apparatus for determining the individual manipulated variables of an internal combustion engine, and in particular of a gas turbine. 4,525,783, Cl. 364-431.110.
Pitney Bowes Inc.: *See—*
Crowley, Raymond R.; and Soderberg, John H., 4,525,786, Cl. 364-466.000.
Gottlieb, Robert K.; and Piotroski, Peter N., 4,525,788, Cl. 364-478.000.
Kulpa, Walter J., 4,524,965, Cl. 271-214.000.
Silverman, Harold; Ramsey, James S.; and Irvine, Robert, 4,524,557, Cl. 53-55.000.
Soderberg, John H.; Eckert, Alton B.; and McFiggans, Robert B., 4,525,785, Cl. 364-464.000.
Pitz, Richard J.; and Jacob, Ezekiel J. Root canal implant, proximity indicative, and method of implantation. 4,525,147, Cl. 433-224.000.
Pivot Metal Works, Inc.: *See—*
Rios, Victor; and Wolf, Henry W., 4,524,486, Cl. 16-381.000.
Plasti-fab, Inc.: *See—*
Vitas, John K.; and Reed, Harry J., 4,524,950, Cl. 251-326.000.
Plastic Specialties and Technologies, Inc.: *See—*
Elias, Moenes L.; and Burger, Walter L., 4,525,240, Cl. 156-659.100.
Plowman, Richard E.; and VanLenten, James A., to Dentsply Research & Development Corp. Centrifugal casting furnace. 4,524,816, Cl. 164-287.000.
Pluquet, Alain A.: *See—*
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,525,135, Cl. 425-290.000.
Pochmarski, Luzian; Koller, Otto; and Abendstein, Karl, to Voest-Alpine Aktiengesellschaft. Process for producing a microkilled steel

suitable for freerun continuous casting for subsequent cold forming. 4,525,211, Cl. 75-58.000.

Pocock, John F. E.; Mahajan, Gautam K.; Krishnakumar, Suppayan M.; and Friendship, Kenneth F. M., to Continental Group, Inc., The. Plastic container with internal rib reinforced bottom. 4,525,401, Cl. 428-64.000.

Poirot, Eugene E.: *See*—
Huff, Terrence; and Poirot, Eugene E., 4,525,467, Cl. 502-121.000.

Polaroid Corporation: *See*—
Agulnek, Martin A.; Canter, Joseph M.; and Reisch, Michael L., 4,525,729, Cl. 346-154.000.
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,525,413, Cl. 428-212.000.

Poliniak, Eugene S.: *See*—
Labib, Mohamed E.; and Poliniak, Eugene S., 4,525,402, Cl. 428-64.000.

Pollacco, Paul J. Motor oil catch pan and motor oil change kit incorporating the same. 4,524,866, Cl. 206-223.000.

Pollock, James F., to Secretary of State for United Kingdom Atomic Energy Authority. Thermal insulation layer. 4,525,406, Cl. 428-137.000.

Polymer Processing Research Institute Ltd.: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.

Polyplastics Co. Ltd.: *See*—
Hotta, Hiroshi; and Suzuki, Yoshiharu, 4,525,261, Cl. 204-192.0EC.

Polysar Limited: *See*—
Sato, Kyosaku, 4,525,517, Cl. 524-394.000.

Pontefract, Ronald M., to Rowntree Mackintosh plc. Data logging device. 4,525,624, Cl. 235-383.000.

Poong San Metal Corp.: *See*—
Kim, Sang K., 4,524,987, Cl. 280-204.000.

Popova, Larisa V.: *See*—
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Porat, Reuven, to Iscar Limited. Sintered hard metal products having a multi-layer wear-resistant coating. 4,525,415, Cl. 428-216.000.

Porter, Marion G.: *See*—
Webster, Marvin K.; Flynn, Richard T.; Porter, Marion G.; and Seminsky, George M., 4,525,777, Cl. 364-200.000.

Porubcan, Randolph S.: *See*—
Gehrman, Sybil H.; and Porubcan, Randolph S., 4,525,351, Cl. 424-95.000.

Posey, Robert G.; and Culbertson, Edwin C., to American Hoechst Corporation. Copolyester primed plastic film. 4,525,419, Cl. 428-336.000.

Potts, James E.: *See*—
Kurtz, Stuart J.; and Potts, James E., 4,525,257, Cl. 204-159.200.

Poulin, Maurice. Method for cleaning a septic tank. 4,525,277, Cl. 210-601.000.

Poupeau, Jean-Jacques: *See*—
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,525,337, Cl. 423-449.000.

Powell, James E.: *See*—
Payne, George B.; and Powell, James E., 4,525,203, Cl. 71-88.000.

Powell, William R.: *See*—
Fischell, Robert E.; Newman, Arnold L.; Riblet, Henry B.; and Powell, William R., 4,524,773, Cl. 128-419.00S.

Power Access Corporation: *See*—
Griffith, Louis E., 4,524,657, Cl. 83-69.000.

Powerflow, Inc.: *See*—
Ward, Douglas K., 4,524,986, Cl. 280-154.50R.

PPG Industries, Inc.: *See*—
Fecik, Michael T.; Ewing, John J.; and Mates, Edward I., 4,525,196, Cl. 65-287.000.
Jensen, Thomas H., 4,525,188, Cl. 65-1.000.

Prange, Uwe: *See*—
Theis, Christoph; and Prange, Uwe, 4,525,310, Cl. 260-465.600.

Pratt, Charles E., to Joseph Ayers, Inc. Modified aluminum tri-alkoxide compounds. 4,525,307, Cl. 556-182.000.

Precision Grinding Limited: *See*—
Andrews, Stanley W., 4,525,041, Cl. 350-484.000.

Premerlani, William J.: *See*—
Hardy, Robert M.; and Premerlani, William J., 4,525,763, Cl. 361-24.000.

Premuzic, Eugene T.: *See*—
Casey, Adria C.; Adler, Alan D.; and Premuzic, Eugene T., 4,525,350, Cl. 424-94.000.

Price, Raymond: *See*—
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,525,330, Cl. 423-24.000.

Primiano, Frank P., Jr.: *See*—
Primiano, George A.; and Primiano, Frank P., Jr., 4,524,464, Cl. 2-161.00A.

Primiano, George A.; and Primiano, Frank P., Jr. Safety glove with modified dorsal thumb spica brace. 4,524,464, Cl. 2-161.00A.

Prince, David: *See*—
Kelley, Robert E.; and Prince, David, 4,524,790, Cl. 132-84.00R.

Pringle, Ronald E., to Camco, Incorporated. Hydraulic controlled well valve. 4,524,831, Cl. 166-322.000.

Pringle, William L., to United States Steel Corporation. Apparatus for joining flared ended tubes. 4,524,501, Cl. 29-237.000.

Probst, Evan N. Windrowed hay fluffing agricultural implement. 4,524,576, Cl. 56-372.000.

Procedyne Corp.: *See*—
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,524,957, Cl. 266-252.000.

Prochaska, Wolfgang; and Schulz, Ralf-Thilo, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Bumper component made of fiber-reinforced material for automobiles or the like. 4,525,005, Cl. 293-117.000.

Procter & Gamble Company, The: *See*—
Howie, John K.; and Bullock, Steven S., 4,525,289, Cl. 252-49.900.

Proctor, Ronald A. Seat belt reel. 4,524,924, Cl. 242-107.40A.

Professional Chemical & Color, Inc.: *See*—
Kelly, David R., 4,525,168, Cl. 8-130.100.

Proform, Inc.: *See*—
Engdahl, Roger, 4,524,700, Cl. 105-377.000.

Prolite Plastics Limited: *See*—
Kaspe, Paul E., 4,525,319, Cl. 264-322.000.

Proprietary Technology, Inc.: *See*—
Bartholomew, Donald D., 4,524,995, Cl. 285-54.000.

Prosan, Richard; Hair, James M., III; and Sheppard, Donald A. Secure locking system employing radiant energy and electrical data transmission. 4,525,805, Cl. 364-900.000.

Prototype Equipment Company: *See*—
Goodman, James A., 4,524,560, Cl. 53-374.000.

Prutec Limited: *See*—
Simpson, Raymond W., 4,525,848, Cl. 375-87.000.

Pryor, James W., to R. J. Reynolds Tobacco Company. Application of additives to cigarette filter tow. 4,525,385, Cl. 427-177.000.

Pschunder, Willi, to Telefunken Electronic GmbH. Wafer-shaped solar cell. 4,525,594, Cl. 136-256.000.

Purdue Research Foundation: *See*—
Chen, Li F.; and Yang, Che-Ming, 4,525,218, Cl. 127-37.000.

Puschner, Peter. Electronic welding energy source. 4,525,621, Cl. 219-137.0PS.

Quan, Peter M.: *See*—
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,525,330, Cl. 423-24.000.

Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., to Dayco Corporation. Belt pulley and method of making the same. 4,525,150, Cl. 474-93.000.

Quickie Manufacturing Corporation: *See*—
Strahs, Martin P.; and Vosbikian, John, 4,524,938, Cl. 248-110.000.

Quinlan, Patrick M., to Petrolite Corporation. Halide free corrosion inhibitors. 4,525,296, Cl. 252-391.000.

R.J. LeVesque Manufacturing Co.: *See*—
Nowak, David J.; and Zupfer, David F., 4,525,006, Cl. 294-19.100.

R. J. Reynolds Tobacco Company: *See*—
Pryor, James W., 4,525,385, Cl. 427-177.000.

Raaf, Helmut, to Blendax-Werke R. Schneider GmbH & Co. Tooth and mouth care agent. 4,525,343, Cl. 424-54.000.

Raasch, Hans; and Lassmann, Manfred, to W. Schlafhorst & Co. Apparatus for controlling the thread joining process in an open end rotor spinning machine. 4,524,578, Cl. 57-263.000.

Racinet, Jean-Claude. Blanket-saddle for sporting horse-riding. 4,524,570, Cl. 54-44.000.

Rahdener Maschinenfabrik August Kolbus: *See*—
Rathert, Horst; and Hedrich, Winfried, 4,524,857, Cl. 198-409.000.

Rajakhyaksha, Vithal J., to Nelson Research & Development Co. Method of improved pest control. 4,525,199, Cl. 514-788.000.

Ramsey, James S.: *See*—
Silverman, Harold; Ramsey, James S.; and Irvine, Robert, 4,524,557, Cl. 53-55.000.

Ranco Incorporated: *See*—
Hall, Dale G., 4,524,948, Cl. 251-139.000.

Randall, Bruce E.: *See*—
Holberton, Philip M.; Randall, Bruce E.; and Marshall, Jay K., 4,525,669, Cl. 324-142.000.

Rapps, Gary M.; and Feder, Alvin, to Motorola, Inc. Method of making a low-profile crystal package with an improved crystal-mounting arrangement. 4,524,497, Cl. 29-25.350.

Rasmussen, Jan. Medical electrode and a method of manufacturing same. 4,524,775, Cl. 128-640.000.

Rasshofer, Werner, to Bayer Aktiengesellschaft. Polyamines and a single-stage process for the production thereof. 4,525,534, Cl. 525-127.000.

Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, to Bayer Aktiengesellschaft. Simplified process for the production of polyamines by the alkaline hydrolysis of compounds containing NCO-groups. 4,525,590, Cl. 544-222.000.

Rastall, Mary H.; Ng, Norman H.; and MacPherson, Edwin J., to Fiberglas Canada Inc. Modified phenolic foams. 4,525,492, Cl. 521-181.000.

Rathert, Horst; and Hedrich, Winfried, to Rahdener Maschinenfabrik August Kolbus. Book block feed device. 4,524,857, Cl. 198-409.000.

Ratzlaff, Howard J., to Hesston Corporation. Underfed crop baler having single rotary feeder. 4,524,574, Cl. 56-341.000.

Raubenheimer, Hans-Jurgen: *See*—
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Raubenheimer, Hans-Jurgen, 4,525,581, Cl. 528-503.000.

Raychem Corporation: *See*—
Zukosky, Mimzee; and Dieck, Ronald L., 4,525,531, Cl. 525-92.000.

Raytheon Company: *See*—
Dorschner, Terry A., 4,525,028, Cl. 350-377.000.

RCA Corporation: *See—*
Fitzgerald, William V., 4,525,739, Cl. 358-190.000.
Freeman, Edward J.; Economou, John E.; Pecorari, John G.; John, Gunter; Halter, Jerome B.; James, Jack E.; Castle, Richard M.; and Palmer, Richard C., 4,525,751, Cl. 358-342.000.
Gillberg, James E., 4,525,635, Cl. 307-247.00R.
Hamalainen, Kaarlo J., 4,525,750, Cl. 358-327.000.
Hanak, Joseph J., 4,525,375, Cl. 427-8.000.
Krufka, Frank S., 4,525,735, Cl. 358-10.000.
Labib, Mohamed E.; and Poliniak, Eugene S., 4,525,402, Cl. 428-64.000.
Wood, Robert F., Jr.; Monahan, John F.; and Levine, Peter A., 4,525,743, Cl. 358-213.000.
Wu, Chung P., 4,525,221, Cl. 148-1.500.

Reading, Christopher: *See—*
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,352, Cl. 424-114.000.
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,525,353, Cl. 424-114.000.

Rebourg, Jean-Claude; and Despois, Claude. Apparatus for performing a Hadamard transformation. 4,525,798, Cl. 364-826.000.

Redlich, Horst, to TELDEC Telefunken - Decca Schallplatten GmbH. Apparatus for removing a cut chip by suction. 4,525,827, Cl. 369-72.000.

Reed, Harry J.: *See—*
Vitas, John K.; and Reed, Harry J., 4,524,950, Cl. 251-326.000.

Regie Nationale des Usines Renault: *See—*
Bascou, Jacques, 4,524,594, Cl. 70-456.00R.
Chastagner, Paul, 4,524,738, Cl. 123-339.000.

Rehder, Ludwig: *See—*
Hubner, Horst; Lydtin, Hans; Rehder, Ludwig; and Zaengel, Thomas, 4,525,379, Cl. 427-53.100.

Rehder, Thomas E.; and Williams, Terrance L., to USG Corporation. Process for expanding and coating perlite. 4,525,388, Cl. 427-221.000.

Reick, Franklin G., to Ebert, Michael. Enhanced grease. 4,525,286, Cl. 252-21.000.

Reil, Wilhelm; Deutschbein, Ulrich; and Wallich, Manfred, to Tetra Pak Developpement S.A. Apparatus for moulding a plastics component onto a length of flexible web material and method for same. 4,525,318, Cl. 264-259.000.

Reinecke, Erich; and Isernhagen, Fritz, to WABCO Fahrzeugbremsen GmbH. Wear compensating operating mechanism for disk brakes. 4,524,850, Cl. 188-71.800.

Reisch, Michael L.: *See—*
Agulnek, Martin A.; Canter, Joseph M.; and Reisch, Michael L., 4,525,729, Cl. 346-154.000.

Reliance Electric Company: *See—*
Johnson, James D.; Belden, Byron B.; and Kamp, Terrence A., 4,525,094, Cl. 403-11.000.
Kammiller, Neil A., 4,525,674, Cl. 328-63.000.

Remcut International Inc.: *See—*
Montiero, Richard, 4,524,511, Cl. 30-108.000.

Renaud, Pierre, to VALEO. Clutch release bearing control mechanism. 4,524,856, Cl. 192-98.000.

Renault, Claude: *See—*
Peignier, Michel; and Renault, Claude, 4,525,515, Cl. 524-378.000.

Reno Energy Systems, Inc.: *See—*
Pehrson, John V., 4,524,836, Cl. 172-4.500.

Renon, Henri: *See—*
Richon, Dominique; and Renon, Henri, 4,524,611, Cl. 73-59.000.

Renshaw, Theodore A., to Fairchild Industries, Inc. Apparatus for preventing step-edge shearing during ultrasonic welding. 4,524,898, Cl. 228-1.100.

Research-Cottrell, Inc.: *See—*
Gleason, Robert J.; and Feldman, Paul L., 4,525,142, Cl. 423-235.000.

Reuters Ltd.: *See—*
Davids, Martin; Blackman, Peter; and Teo, Lily, 4,525,779, Cl. 364-200.000.

Rhein-Nadel Maschinennadel Gesellschaft mit beschrankter Haftung: *See—*
Pavel, Klaus; and Lange, Horst, 4,524,815, Cl. 163-5.000.

Rheinmetall GmbH: *See—*
Altenau, Ernst-Wilhelm; Hahn, Ulf; and Sabranski, Udo, 4,524,696, Cl. 102-491.000.
Bocker, Jurgen; Gersbach, Klaus; Bethmann, Karl W.; and Glotz, Gerhard, 4,524,697, Cl. 102-517.000.
Boeder, Dieter, 4,524,694, Cl. 102-393.000.

Rhoads, Jack L. Hydraulic valve lifter with continuous void. 4,524,731, Cl. 123-90.570.

Rhone-Poulenc Specialites Chimiques: *See—*
Laisney, Bernard; Letoffe, Michel; Perrin, Patrice; and Ulrich, Jean, 4,525,565, Cl. 528-17.000.
Leising, Frederic, 4,525,519, Cl. 524-457.000.
Peignier, Michel; and Renault, Claude, 4,525,515, Cl. 524-378.000.

Rhythm Watch Company Limited: *See—*
Takebe, Katuhiko, 4,525,076, Cl. 368-63.000.

Riblet, Henry B.: *See—*
Fischell, Robert E.; Newman, Arnold L.; Riblet, Henry B.; and Powell, William R., 4,524,773, Cl. 128-419.00S.

Richardsson, Gote E.: *See—*
Danielson, Carl O.; Gustafsson, Bo B.; Richardsson, Gote E.; and Lundh, Karl-Erik, 4,524,880, Cl. 220-288.000.

Richmond, Carl T.; Butler, Thomas A.; and Andrews, Joseph E., Jr., to Motorola, Inc. Ultra linear frequency discriminator circuitry. 4,525,675, Cl. 328-140.000.

Richmond, Kenneth D.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.

Richon, Dominique; and Renon, Henri, to Association pour la Recherche et le Developpement des Methodes et Processus Industriels (ARMINES). Rheometer for measuring high pressure and high temperature with sampling. 4,524,611, Cl. 73-59.000.

Richter, Horst: *See—*
Dislich, Heinz; and Richter, Horst, 4,525,463, Cl. 501-99.000.

Ricoh Company, Ltd.: *See—*
Abe, Michiharu, 4,525,625, Cl. 250-201.000.
Yanagida, Shoji, 4,525,658, Cl. 318-317.000.

Riddle, Eddie R.: *See—*
Molbert, John L.; and Riddle, Eddie R., 4,525,854, Cl. 378-089.000.

Riddle, Ronald G., to Riddle, Terrence Arthur, a part interest. Tripod. 4,524,849, Cl. 182-170.000.

Riddle, Terrence Arthur: *See—*
Riddle, Ronald G., 4,524,849, Cl. 182-170.000.

Ried, Alois: *See—*
Schwellinger, Pius; Ried, Alois; Timm, Jurgen; and Heckler, Manfred, 4,525,326, Cl. 420-535.000.

Rieter Machine Works, Ltd.: *See—*
Feusi, Markus; Huber, Josef; Oswald, Heinz; and Pfyffer, Peter, 4,524,918, Cl. 242-18.00A.
Wurmli, Arthur, 4,524,579, Cl. 57-276.000.

Riley, Arthur W.: *See—*
Riley, Patrice J.; and Riley, Arthur W., 4,525,090, Cl. 401-127.000.

Riley, Patrice J.; and Riley, Arthur W. Liquid dispensing bottles with built-in applicators. 4,525,090, Cl. 401-127.000.

Rios, Victor; and Wolf, Henry W., to Pivot Metal Works, Inc. Self-locking, self-aligning stepped spring hinge pin. 4,524,486, Cl. 16-381.000.

Ripkens, Gerd; Schittek, Hans; and Buschfeld, Adolf, to Deutsche Texaco Aktiengesellschaft. Process for the manufacture of multi-layer particle board using a phenol formaldehyde resin having a lower solids content. 4,525,227, Cl. 156-62.200.

Rising, Donald B.; and Naegeli, Richard G., Jr., to Millipore Corporation. I.V. Filter apparatus. 4,525,182, Cl. 55-159.000.

Riva, Ermete: *See—*
Italiano, Pietro; and Riva, Ermete, 4,524,605, Cl. 73-38.000.

Roantree, Michael L.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. 2-Thiazolyl, isothiazolyl, oxazolyl and isoxazolyl alkylamino-3-nitro-heterocyclic compounds. 4,525,477, Cl. 514-333.000.

Robbins, Robert E.: *See—*
Holland, Marion D., 4,524,800, Cl. 137-516.270.

Robert Bosch GmbH: *See—*
Heinz, Richard; and Kutzner, Reinhard, 4,525,840, Cl. 371-47.000.
Hofman, Eberhard, 4,524,737, Cl. 123-300.000.
Lungu, Corneliu, 4,524,797, Cl. 137-343.000.
Pischke, Jurgen; and Nonnenmann, Wolfgang, 4,525,783, Cl. 364-431.110.

Robertson, Arthur B., to Mobil Oil Corporation. Shaped articles from poly (p-methylstyrene) blends. 4,525,395, Cl. 428-35.000.

Robra, Joerg; and Goschin, Hans, to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH. Method of and a circuit for energizing a subscriber's circuit in a telephone system. 4,525,602, Cl. 179-16.00F.

Robroy Industries: *See—*
Zizan, John P., 4,524,937, Cl. 248-74.300.

Roccaforte, Harry I.; and Christie, Robert A., to Champion International Corporation. Visible and easy accessible package. 4,524,870, Cl. 206-608.000.

Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., to Hydril Company. Diverter/BOP system and method for a bottom supported offshore drilling rig. 4,524,832, Cl. 166-347.000.

Rockwell International Corporation: *See—*
Artz, Glen D.; and Flanagan, Joseph E., 4,525,226, Cl. 149-35.000.
Majefski, Richard L., 4,525,684, Cl. 330-304.000.
Moge , Robert A., 4,524,863, Cl. 198-797.000.

Rodda, Donald; and Odermann, Charles R., to Singer Company, The. Noise suppression and thread control arrangement for a sewing machine. 4,524,708, Cl. 112-231.000.

Rode, Christian S.: *See—*
Curran, Kevin G.; Golson, Steven E.; and Rode, Christian S., 4,525,599, Cl. 178-22.080.

Rodeheaver, Bradley D.: *See—*
Horn, Richard E.; and Rodeheaver, Bradley D., 4,525,259, Cl. 204-182.400.

Rodriguez, Ludovic: *See—*
Baltes, Eugene ; de Lannoy, Jean; and Rodriguez, Ludovic, 4,525,358, Cl. 514-255.000.

Rodvelt, Ronnie L., to Didde Graphic Systems Corporation. Electronic ink flow control for printing. 4,524,692, Cl. 101-350.000.

Rogers Corporation: *See—*
McMonagle, Rodger P., 4,525,247, Cl. 204-24.000.

Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian. Ronald A., to Polaroid Corporation. Optical device including birefringent polymer. 4,525,413, Cl. 428-212.000.

Rogers, Jerry W.: *See—*
Speer, Billy L.; Burris, Lee R.; and Rogers, Jerry W., 4,525,152, Cl. 474-133.000.

Rogers, Larry K., to American Standard Inc. Hydraulic cylinder locking device. 4,524,676, Cl. 91-43.000.

Rohm GmbH: *See*—
Dinklage, Horst; Fink, Herbert; and Wolf, Hans-Peter, 4,525,418, Cl. 428-264.000.

Rohrbach, Ronald P., to UOP Inc. Support matrix and immobilized enzyme system. 4,525,456, Cl. 435-176.000.

Romanenko, Anatoly G.: *See*—
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.

Rome, Gerald F.; and Lankford, Frank L., Jr., to Texaco Inc. Safety system for an oil well derrick. 4,524,952, Cl. 254-269.000.

Romer, Bendt W., to Danfoss A/S. Pressure valve for a compressor. 4,524,806, Cl. 137-856.000.

Rooklyn, Jack, to Industrial Management Co. Conductive laminate product for application to vertical and horizontal surfaces. 4,525,398, Cl. 428-40.000.

Rooney, John M.; Woods, John; and Conway, Paul, to Loctite (Ireland) Ltd. Polymerizable acrylic compositions having vinyl ether additive. 4,525,232, Cl. 156-273.300.

Rooney, John M.; and Conway, Paul, to Loctite (Ireland) Limited. Acrylic polymerization catalysts containing ferricenium salts. 4,525,553, Cl. 526-120.000.

Ropars, Marcel; and Bloch, Bertrand, to Societe Nationale des Poudres et Explosifs; and Office National d'Etudes et de Recherches Aerospatiales. Thermoset polymers and prepolymers obtained by polycondensation of alkyl pyridine with hydroxyl aromatic monoaldehydes. 4,525,573, Cl. 528-232.000.

Rorden, William L., to Grass Valley Group, Inc., The. Differential amplifier having high common-mode rejection ratio. 4,525,677, Cl. 330-258.000.

Rosa, Roger A.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,525,135, Cl. 425-290.000.

Rosemount Inc.: *See*—
Myhre, Douglas C., 4,525,081, Cl. 374-208.000.

Rosen, William E.: *See*—
Berke, Philip A.; and Rosen, William E., 4,525,480, Cl. 514-544.000.

Rosenberg, Lawrence M., to Micronix Partners. Alignment apparatus. 4,525,852, Cl. 378-34.000.

Rosenberg, Melvin: *See*—
Weiss, Ervin; Rosenberg, Melvin; and Judas, Herbert, 4,525,342, Cl. 424-49.000.

Ross, L. Wayne. Toothbrush. 4,524,478, Cl. 15-106.000.

Rotabolt Limited: *See*—
Hirst, John A. B., 4,525,114, Cl. 411-9.000.

Rotz, C. Alan: *See*—
Wilde, Bernard D.; Van Ee, Gary R.; Ledebuhr, Richard L.; and Rotz, C. Alan, 4,524,572, Cl. 56-327.00R.

Rouws, Petrus L. A., to U.S. Philips Corporation. Apparatus and mounting shell having retaining tongues formed by cuts. 4,524,933, Cl. 248-27.300.

Rovema Verpackungsmaschinen GmbH & Co. KG: *See*—
Hauers, Manfred; and Baur, Walter, 4,524,566, Cl. 53-534.000.

Rowe, Neal E., to Westinghouse Electric Corp. Method of rolling a simulated hole in sheet metal without drilling or punching. 4,524,598, Cl. 72-198.000.

Rowles, Howard C.: *See*—
Woodward, Donald W.; Katsaros, Arthur T.; and Rowles, Howard C., 4,525,187, Cl. 62-31.000.

Rowley, William W. Application for forming a plastic tube coupling. 4,525,136, Cl. 425-384.000.

Rowntree Mackintosh plc: *See*—
Pontefract, Ronald M., 4,525,624, Cl. 235-383.000.

Rozniecki, Edward J. Oscillating flow nozzle. 4,524,911, Cl. 239-101.000.

Rozzell, J. David, to Genetics Institute, Inc. Production of L-4-phenyl-2-aminobutanoic acid by transamination. 4,525,454, Cl. 435-106.000.

Rubbert, Bernhard: *See*—
Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, 4,525,570, Cl. 528-75.000.

Rubin, Harvey, to AT&T Bell Laboratories. Digital signal generator. 4,525,795, Cl. 364-721.000.

Rubin, Harvey: *See*—
Kemper, Kyran B.; and Rubin, Harvey, 4,525,789, Cl. 364-481.000.

Rudle, Manfred: *See*—
Stoll, Kurt; and Rudle, Manfred, 4,524,803, Cl. 137-625.640.

Rudoi, Boris L. Apparatus for simultaneous production of double glass panels. 4,525,194, Cl. 65-145.000.

Ruggles, Wesley, Jr.: *See*—
Willcocks, Martin E. G., 4,525,855, Cl. 381-22.000.

Ruhle, Manfred: *See*—
Claussen, Nils; Ruhle, Manfred; and Petzow, Gunter, 4,525,464, Cl. 501-103.000.

Ruiz, Marco A.: *See*—
Wever, Ruben; Allred, Lorin D.; and Ruiz, Marco A., 4,525,605, Cl. 179-175.20R.

Rumble, Ray M., to Michigan Hanger Company, Inc. Pipe hanger. 4,524,934, Cl. 248-62.000.

Rumble, Ray M., to Michigan Hanger Company, Inc. Pipe hanger. 4,524,935, Cl. 248-62.000.

Rupe, Iris A. Sanitary tasting spoon. 4,524,517, Cl. 30-324.000.

Ruskin Manufacturing Company: *See*—
Klebanoff, Steven L., 4,524,678, Cl. 98-1.000.

Russell, Frank S.; and Simonelli, Robert J., to Sleeper & Hartley Corp. Method of supporting a camshaft in a wire coiling machine. 4,524,597, Cl. 72-135.000.

Russo, John B. Device for deterring unauthorized climbing of permanent ladders. 4,524,848, Cl. 182-77.000.

Ryan, Martin A.: *See*—
McHenry, Robert J.; and Ryan, Martin A., 4,525,134, Cl. 425-130.000.

Ryobi Ltd.: *See*—
Ozaki, Kiyomi; and Tsunoda, Kikuo, 4,524,921, Cl. 242-84.10J.
Tunoda, Kikuo; and Ozaki, Kiyomi, 4,524,923, Cl. 242-84.50A.

S.D.S. Industries, Inc.: *See*—
Day, Robert H., 4,525,099, Cl. 403-371.000.

S.N.E.C.M.A.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,525,135, Cl. 425-290.000.

Saalasti, Vaino T. Method for the clarification of water. 4,525,284, Cl. 210-777.000.

Sabins, Fred; and Childs, Jerry D., to Halliburton Company. Method of using thixotropic cements for combating gas migration problems. 4,524,828, Cl. 166-293.000.

Sabranski, Udo: *See*—
Altenau, Ernst-Wilhelm; Hahn, Ulf; and Sabranski, Udo, 4,524,696, Cl. 102-491.000.

Sachdev, Harbans S.: *See*—
Sachdev, Krishna G.; Sachdev, Harbans S.; Aviram, Ari; and Wizner, Mark A., 4,525,722, Cl. 346-1.100.

Sachdev, Krishna G.; Sachdev, Harbans S.; Aviram, Ari; and Wizner, Mark A., to International Business Machines Corporation. Chemical heat amplification in thermal transfer printing. 4,525,722, Cl. 346-1.100.

Sackett, Robert L. Fluid flow failure detection means. 4,524,736, Cl. 123-198.00D.

Sada, Takeshi: *See*—
Kato, Hidetoshi; Sada, Takeshi; Mayumi, Nobuo; and Matsuhashi, Hajime, 4,525,662, Cl. 322-28.000.

Sadhu, Kizhakethil M.: *See*—
Matteson, Donald S.; and Sadhu, Kizhakethil M., 4,525,309, Cl. 260-462.00C.

Sado, Ryoichi. Sensor switch. 4,525,606, Cl. 200-5.00A.

SAE s.r.l.: *See*—
Del Fabro, Marcello; and Del Fabro, Giorgio, 4,524,656, Cl. 83-23.000.

Sagawa, Nobukazu: *See*—
Kawamura, Hideo; Sagawa, Nobukazu; and Yamamoto, Noriyoshi, 4,525,622, Cl. 219-270.000.

Sahatjian, Ronald A.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,525,413, Cl. 428-212.000.

Saikosha Works Ltd.: *See*—
Saitoh, Hisashi, 4,524,592, Cl. 70-287.000.

Saino, Tetsushi: *See*—
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.

Saito, Akihiro, to Fujikogyosho Co., Ltd. Method and apparatus for automatic electric seam resistance welding of can bodies. 4,525,617, Cl. 219-83.000.

Saito, Sueo: *See*—
Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, 4,524,824, Cl. 106-35.000.

Saito, Susumu: *See*—
Tatsuno, Kimio; and Saito, Susumu, 4,525,024, Cl. 350-6.500.

Saito, Takashi; Suzuki, Kazumoto; and Naganuma, Yoshihiro, to Fujikura Ltd. Magnetic material wire. 4,525,432, Cl. 428-653.000.

Saito, Tamio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing multilayer circuit substrate. 4,525,383, Cl. 427-89.000.

Saitoh, Hisashi, to Saikosha Works Ltd. Combination lock. 4,524,592, Cl. 70-287.000.

Saitoh, Koichi: *See*—
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, 4,525,723, Cl. 346-74.400.

Saitoh, Osamu: *See*—
Tanaka, Masaru; Noguchi, Naoki; Yoshino, Kenji; and Saitoh, Osamu, 4,525,069, Cl. 356-435.000.

Saitou, Sinichi: *See*—
Nemoto, Shigeru; Saitou, Sinichi; Kitajima, Goro ; and Osada, Hazime, 4,525,760, Cl. 360-137.000.

Sakaguchi, Toshiharu: *See*—
Yamane, Toshihiro; Ohashi, Kenzi; and Sakaguchi, Toshiharu, 4,525,297, Cl. 252-511.000.

Sakai, Hiroyuki: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,525,189, Cl. 65-3.150.

Sakai, Kazuo: *See*—
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,525,269, Cl. 208-309.000.

Sakai, Toshiyuki; Ohta, Yuichi; Minoh, Michihiko; and Hino, Masatoshi. Analog-to-digital image signal conversion. 4,525,747, Cl. 358-284.000.

Sakamoto, Masahide: *See*—
Kashiwaya, Mineo; Morita, Kiyomi; and Sakamoto, Masahide, 4,524,739, Cl. 123-339.000.

Sakamoto, Susumu: *See*—
Nakane, Yasuaki; Akamatsu, Junichi; Sakamoto, Susumu; and Kiyomiya, Tadashi, 4,525,412, Cl. 428-199.000.

Sakata, Ko; and Imai, Hirosuke, to Nippon Oil Co., Ltd. Method of immobilizing enzymatically active materials. 4,525,457, Cl. 435-178.000.

Sakura Color Products Corp.: *See—*
Nakanishi, Mikihiko, 4,525,216, Cl. 106-30.000.
Shioi, Keiko; and Nakanishi, Mikihiko, 4,525,215, Cl. 106-22.000.

Sakurai, Masaaki: *See—*
Hirabayashi, Hiromitsu; Sakurai, Masaaki; and Kagiura, Kazuo, 4,525,058, Cl. 355-3.0FU.

Sakurai, Yasuo: *See—*
Imanishi, Kiyokazu; Ichiyanagi, Takashi; Sakurai, Yasuo; Naka, Hirouki; and Nakagawa, Koji, 4,525,757, Cl. 360-130.240.

Salama, Clement A. T.: *See—*
Wong, Stephen L.; and Salama, Clement A. T., 4,525,679, Cl. 330-277.000.

Saletta, Gary F.: *See—*
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., 4,525,650, Cl. 315-226.000.

Salminen, Arvo, to A. Ahlstrom Osakeyhtio. Two-piece sliding box with tear strip separation. 4,524,900, Cl. 229-19.000.

Samakaev, Rafail K.: *See—*
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.

Sambucetti, Carlos J.: *See—*
Alpaugh, Warren A.; Amelio, William J.; Markovich, Voya; and Sambucetti, Carlos J., 4,525,390, Cl. 427-305.000.

Sanchez, Dale R.: *See—*
Willus, Charles A.; Kosonen, Vaino J.; and Sanchez, Dale R., 4,525,274, Cl. 210-232.000.

Sanchez, Jose, to Pennwalt Corporation. Hydroxy-t-alkyl peroxyesters. 4,525,308, Cl. 260-453.0RZ.

Sandahl, Joel E.: *See—*
Hesselberth, Robert J.; Donaher, Thomas P.; and Sandahl, Joel E., 4,525,685, Cl. 331-10.000.

Sander, Wilfried, to Pfaff Industriemaschinen GmbH. Device for feeding and sewing a trimming ribbon to a garment part. 4,524,707, Cl. 112-152.000.

Sandor, Istvan: *See—*
Lawrence, John N.; and Sandor, Istvan, 4,524,802, Cl. 137-595.000.

Sangamo Weston, Inc.: *See—*
Holberton, Philip M.; Randall, Bruce E.; and Marshall, Jay K., 4,525,669, Cl. 324-142.000.

Sano, Yoshiaki; Tsuchiya, Chikara; and Maida, Osamu, to Fujitsu Limited; and Nippon Kogaku K.K. Integrated circuit having an input voltage-clamping function and an input current-detecting function. 4,525,637, Cl. 307-350.000.

Sansom, David J., to EMI Limited. Apparatus for sensing two components of a magnetic field. 4,525,671, Cl. 324-252.000.

Santalucia, Andre R.: *See—*
Billard, Alain A.; Santalucia, Andre R.; and Breseghello, Christian, 4,524,670, Cl. 89-1.530.

Santrade Ltd.: *See—*
Bylund, Sven O., 4,525,109, Cl. 407-36.000.

Sappok, Reinhard J.: *See—*
Patil, Arvind S.; Bantjes, John H.; Pepoy, Louis J.; and Sappok, Reinhard J., 4,525,217, Cl. 106-304.000.

Sarh, Branko; and Pasenau, Hartmut, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Surface type structural component, especially for aircraft. 4,524,556, Cl. 52-807.000.

Sartori, Guido; and Thaler, Warren A., to Exxon Research and Engineering Co. Amino acid mixtures, their alkali metal salts and process for preparing same. 4,525,294, Cl. 252-182.000.

Sarumaru, Kazumasa. Method of preheating and preforming a green tire. 4,525,320, Cl. 264-502.000.

Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Method of cleaning endoscope channels. 4,525,220, Cl. 134-21.000.

Sasaki, Hiroharu: *See—*
Hayashi, Masaaki; and Sasaki, Hiroharu, 4,525,499, Cl. 523-523.000.

Sasaki, Satoshi: *See—*
Kominami, Yasuo; Ohkubo, Yuichi; Aizawa, Kohki; and Sasaki, Satoshi, 4,525,636, Cl. 307-264.000.

Sasaki, Yasuharu: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,525,589, Cl. 544-128.000.

Sassi, Carlo, to Tito Manzini & Figli S.p.A. Process and plant for aseptic filling of pre-sterilized, non-rigid containers. 4,524,563, Cl. 53-426.000.

Sasso, Albert. Two dimensional puzzle. 4,524,971, Cl. 273-153.00S.

Sato, Hachiro, to Fukoku Kogyo Co., Ltd. Continuous press. 4,524,684, Cl. 100-117.000.

Sato, Ikuro; and Iwata, Ryuichi, to NEC Corporation. Dual-band antenna system of a beam waveguide type. 4,525,719, Cl. 343-761.000.

Sato, Kazutoshi: *See—*
Fukawa, Isaburo; and Sato, Kazutoshi, 4,525,546, Cl. 526-68.000.

Sato, Kyosaku, to Polysar Limited. Vulcanizable polymer compositions with improved scorch. 4,525,517, Cl. 524-394.000.

Sato, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor device. 4,524,508, Cl. 29-571.000.

Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. Certain 4-aryl-1,4-dihydro-3,5-pyridinedicarboxylates having vasodilating and antihypertensive properties. 4,525,478, Cl. 514-350.000.

Sato, Youji; Omata, Nobuaki; and Shimbara, Sakuzo, to Nifco Inc. Detachable fastener. 4,524,494, Cl. 24-453.000.

Sauget, Bernard, to Construction-Gerance-Exploitation "CONGEX". Foil transfer device for an installation for manufacturing hollow truncated cone shaped articles and in particular wine bottle caps. 4,525,154, Cl. 493-154.000.

Sauvestre, Jean C.: *See—*
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Savage, Kerry D., to Texaco Inc. Method of heating an oil shale formation. 4,524,826, Cl. 166-248.000.

Sawada, Yoshizo: *See—*
Meguro, Takashi; Ogata, Yasunobu; and Sawada, Yoshizo, 4,525,222, Cl. 148-121.000.

Sawano, Katsutoshi; and Miyashita, Tetsuharu, to Iwatsu Electric Co., Ltd. System for observing a plurality of digital signals. 4,525,667, Cl. 324-140.00R.

Sawano, Susumu; Gofuku, Yoshihiro; Hashimoto, Junji; and Ando, Takayuki, to Tokico Ltd. Mechanical snubber. 4,524,851, Cl. 188-134.000.

Sawazaki, Norikazu: *See—*
Higashiyama, Yasushi; Chiba, Shu; and Sawazaki, Norikazu, 4,525,828, Cl. 369-111.000.

Saxby, Willard A.; and Pikula, Robert D. Pressurizing and closure apparatus for carbonated beverage containers. 4,524,877, Cl. 215-228.000.

Sazdanoff, Elizabeth. Finger rest for manicuring. 4,524,789, Cl. 132-73.000.

Scan-Optics, Inc.: *See—*
D'Angelo, Kenneth R.; and Childress, Timothy T., 4,524,963, Cl. 271-3.100.

Schaefer, Helmut. Insole for shoes. 4,524,529, Cl. 36-98.000.

Schefczik, Ernst: *See—*
Lotsch, Wolfgang; Kemper, Reinhard; and Schefczik, Ernst, 4,525,591, Cl. 544-250.000.

Scheffer, Daniel G.; Brock, Christopher W.; and Schumer, Douglas B., to Ohaus Scale Corporation. Electronic balance. 4,525,794, Cl. 364-567.000.

Scheibengraber, Karl J. Stirling engine. 4,524,583, Cl. 60-525.000.

Scheicher, Hans; Siegele, Dieter; and Soltesz, Uwe, to Fraunhofer-Gesellschaft zur Forderung der angwandten Forschung e.V.; and Scheicher, Hans. Connecting device for joining a superstructure element with an implant member. 4,525,145, Cl. 433-173.000.

Scheiwiller, Rolf. Construction units for the erection of walls and method of utilization. 4,524,551, Cl. 52-98.000.

Schenkel, Klaus D.; and Welzenbach, Manfred, to LICENTIA Patent-Verwaltungs-GmbH. Service integrated digital transmission system. 4,525,834, Cl. 370-3.000.

Schering AG: *See—*
Burba, Christian; and Franz, Herbert, 4,525,571, Cl. 528-111.000.

Schering Aktiengesellschaft: *See—*
Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Kohl, Wilhelm, 4,525,197, Cl. 71-11.000.

Scheuermann, Helmut, to Licentia Patent-Verwaltungs-GmbH. Method for interchanging n partial bands. 4,525,844, Cl. 375-2.100.

Schick, Rupert: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,525,484, Cl. 521-56.000.

Schildkraut, Alan L.; and Brush, Robert W., Sr., to Allied Corporation. Anti-decoupling mechanism for an electrical connector assembly. 4,525,017, Cl. 339-89.00M.

Schiller, Siegfried: *See—*
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, 4,524,717, Cl. 118-718.000.

Schimmel, Gunther; Heymer, Gero; Krause, Werner; and Pieper, Werner, to Hoechst Aktiengesellschaft. Process for separating gallium and indium from aqueous solutions. 4,525,333, Cl. 423-112.000.

Schindler, Wolfgang: *See—*
Krempl, Peter W.; and Schindler, Wolfgang, 4,525,627, Cl. 250-345.000.

Schittek, Hans: *See—*
Ripkens, Gerd; Schittek, Hans; and Buschfeld, Adolf, 4,525,227, Cl. 156-62.200.

Schleimer, Stephen I.: *See—*
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.

Schlicht, Raymond C., to Texaco Inc. Lubricants containing hydroxyalkoxy acid amides of alkyl amines as friction reducers. 4,525,288, Cl. 252-32.70E.

Schmidt, Donald R., to Encon Systems, Ltd. Modified full-flow filter and by-pass filter apparatus for internal combustion engines. 4,524,733, Cl. 123-196.00A.

Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., to Allied Corporation. Electrochemical gas sensor. 4,525,266, Cl. 204-412.000.

Schmidt, John C.: *See—*
Campbell, Donald N.; and Schmidt, John C., 4,525,704, Cl. 340-632.000.

Schmidt, Karl W., to Gebruder Schmidt GmbH & Co. KG. System for retaining a wall on a clock housing. 4,525,079, Cl. 368-276.000.

Schmidt, Klaus, to Carl Freudenberg, Firma. Cleaning cloth. 4,525,411, Cl. 428-198.000.

Schmidt, Robert R., to Eastman Kodak Company. Highly active and efficient polyolefin catalyst. 4,525,551, Cl. 526-116.000.

Schmidt, Wolfgang; and Longo, Jose M., to Dornier GmbH. Wing-sections, in particular aircraft lift-wing sections. 4,524,928, Cl. 244-35.00R.
Schneckenburger, Gerhard: *See*—
Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, 4,524,804, Cl. 137-625.640.
Schneider, Alfred: *See*—
Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Kohl, Wilhelm, 4,525,197, Cl. 71-11.000.
Schneiderman, Gary E.: *See*—
Withers, Stanley J.; Schneiderman, Gary E.; and Little, William M., Jr., 4,524,776, Cl. 128-644.000.
Schoen, Roger: *See*—
Tourtellier, Jean-Louis; and Schoen, Roger, 4,524,698, Cl. 104-107.000.
Schonborn, Jurgen: *See*—
Mangold, Hans; Eckert, Hans; and Schonborn, Jurgen, 4,525,746, Cl. 358-254.000.
Schraff, Raymond J.: *See*—
Miller, Thomas M.; Schraff, Raymond J.; and Labas, Nicholas, 4,524,702, Cl. 110-173.00A.
Schreiber, William L.: *See*—
Wiegers, Wilhelmus J.; Fenn, Ronald S.; Boden, Richard M.; and Schreiber, William L., 4,524,783, Cl. 131-276.000.
Schubert, Elliot V. Heating appliance. 4,524,754, Cl. 126-110.00R.
Schuler, Daniel: *See*—
Hulin, Rene ; and Schuler, Daniel, 4,524,635, Cl. 74-476.000.
Schulman, David A. Seat having movable supporting surfaces. 4,524,762, Cl. 128-33.000.
Schulte-Elte, Karl H.; and Muller, Bernard L., to Firmenich SA. Aliphatic alcohols and esters and their use as perfuming ingredients. 4,525,298, Cl. 252-522.00R.
Schulte, Heinrich: *See*—
Gotte, Elmar; and Schulte, Heinrich, 4,524,859, Cl. 198-735.000.
Schulte, Heinz: *See*—
Mucheyer, Norbert; and Schulte, Heinz, 4,524,945, Cl. 251-75.000.
Schulthess, Dieter: *See*—
Gaisch, Helmut; and Schulthess, Dieter, 4,524,786, Cl. 131-308.000.
Schulz, Ralf-Thilo: *See*—
Prochaska, Wolfgang; and Schulz, Ralf-Thilo, 4,525,005, Cl. 293-117.000.
Schumer, Douglas B.: *See*—
Scheffer, Daniel G.; Brock, Christopher W.; and Schumer, Douglas B., 4,525,794, Cl. 364-567.000.
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, to Siemens Aktiengesellschaft. Method for manufacturing VLSI complementary MOS field effect circuits. 4,525,378, Cl. 427-38.000.
Schwarz, James A.; and Pasco, Robert W., to Syracuse University. Hydrogen charged thin film conductor. 4,525,734, Cl. 357-67.000.
Schwarzmann, Russell A.: *See*—
Lillibridge, Herbert J.; and Schwarzmann, Russell A., 4,524,980, Cl. 277-199.000.
Schweizer, Heiner: *See*—
Class, Eberhard; Schweizer, Heiner; and Frank, Gunther, 4,524,843, Cl. 180-179.000.
Schwellinger, Pius; Ried, Alois; Timm, Jurgen; and Heckler, Manfred, to Swiss Aluminium Ltd. Aluminum alloy. 4,525,326, Cl. 420-535.000.
Schwenzer, Reinhard: *See*—
Goedecke, Wolf-Dieter; Schneckenburger, Gerhard; and Schwenzer, Reinhard, 4,524,804, Cl. 137-625.640.
Schwindt, Gary W., to Litton Systems, Inc. Preassembled press fit connector with assembly insert. 4,525,015, Cl. 339-17.00C.
Schwinn Bicycle Company: *See*—
Centeny, Norman L., 4,524,989, Cl. 280-281.00R.
Science Applications International Corporation: *See*—
Pelletier, Charles A.; Gonso, William E., Jr.; Cameron, Douglas S.; and Leonard, Patrick R., 4,524,607, Cl. 73-40.50R.
SCM Corporation: *See*—
Abbey, Kirk J.; and Erickson, James R., 4,525,260, Cl. 204-181.700.
Craun, Gary P.; and DeGraaf, Henry J., 4,525,535, Cl. 525-163.000.
Scott, John H., to Boeing Company, The. Automatic trim system for hydrofoil craft. 4,524,710, Cl. 114-275.000.
Seals Eastern Inc.: *See*—
Hertz, Daniel L., Jr., 4,524,982, Cl. 277-229.000.
Secretary of State for United Kingdom Atomic Energy Authority: *See*—
Pollock, James F., 4,525,406, Cl. 428-137.000.
Seidler, Klaus: *See*—
Fahrmbacher-Lutz, Ludwig; and Seidler, Klaus, 4,525,250, Cl. 204-58.500.
Seiko Instruments & Electronics Ltd.: *See*—
Hoshi, Hideo; and Kamamori, Hitoshi, 4,525,710, Cl. 340-784.000.
Kawashima, Hirofumi, 4,525,646, Cl. 310-360.000.
Seikosha Co., Ltd.: *See*—
Ikeda, Yoshiaki, 4,525,084, Cl. 400-55.000.
Seitz, Fred H.; and Jaschke, Max J., to Air Cabin Engineering. Magnetic target assembly. 4,524,976, Cl. 273-388.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Thermosetting latex coating compositions produced by copolymerization in aqueous emulsion in the presence of water-insoluble polyhydric alcohol. 4,525,510, Cl. 524-156.000.
Sekmakas, Kazys; and Murphy, Edward J., to DeSoto, Inc. Epoxy-free hydroxy functional polyether based on oleyl alcohol and solvent-soluble copolymers containing the same. 4,525,543, Cl. 525-529.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,525,435, Cl. 429-111.000.
Yamazaki, Shunpei, 4,525,436, Cl. 429-111.000.
Yamazaki, Shunpei, 4,525,437, Cl. 429-111.000.
Seminsky, George M.: *See*—
Webster, Marvin K.; Flynn, Richard T.; Porter, Marion G.; and Seminsky, George M., 4,525,777, Cl. 364-200.000.
Senco Products, Inc.: *See*—
Morrell, Robert F., Jr., 4,524,896, Cl. 227-126.000.
Seng-Jung, Chen: *See*—
Maw-Cheng, Shieh; Seng-Jung, Chen; Li-Jung, Hu; and Jin-Luh, Su, 4,525,210, Cl. 75-58.000.
Seno, Makito: *See*—
Misawa, Yoshihiko; Seno, Makito; and Fujiwara, Koji, 4,524,860, Cl. 198-740.000.
Senoh, Yasutaka. Simplified electric switch construction. 4,525,607, Cl. 200-16.00R.
Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,525,018, Cl. 339-91.00R.
Seragnoli, Enzo, to G.D Societa' per Azioni. Cigarette-making machine with an auxiliary tobacco supply unit. 4,524,781, Cl. 131-108.000.
Seragnoli, Enzo; and Neri, Armando, to G.D Societa' per Azioni. Device for forming perforations in bar-shape articles. 4,524,784, Cl. 131-281.000.
Seragnoli, Enzo; and Neri, Armando, to G.D Societa' per Azioni. Method and apparatus for forming perforations in bar-like articles. 4,524,785, Cl. 131-281.000.
Serrao, Charles A., to Argentino, Giovanni. Restraint garment. 4,524,768, Cl. 128-134.000.
Serrone, Michael J.: *See*—
Wagner, Gary L.; and Serrone, Michael J., 4,525,689, Cl. 333-104.000.
Sewell Plastics, Inc.: *See*—
Nickel, Gerhard E. B.; and Alberghini, Alfred C., 4,525,377, Cl. 427-12.000.
Seymour, David J.: *See*—
Lehmann, Randall E.; Brehm, Gailon E.; and Seymour, David J., 4,525,678, Cl. 330-277.000.
Sfernice Societe Francaise de l'Electro-Resistance: *See*—
Flassayer, Claude; Le Grives, Bernard; and Simon, Paul R., 4,525,238, Cl. 156-645.000.
Shah, Navnit: *See*—
Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, 4,525,339, Cl. 424-16.000.
Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,525,510, Cl. 524-156.000.
Shakib, Iraj D.: *See*—
Field, Thomas R.; Hughes, Frank M.; Shakib, Iraj D.; and Vitek, Edward J., Jr., 4,525,086, Cl. 400-144.200.
Shannon, Mark L.: *See*—
Mack, Mark P.; and Shannon, Mark L., 4,525,468, Cl. 502-104.000.
Shannon, Paul J.: *See*—
Phan, Xuan T.; and Shannon, Paul J., 4,525,302, Cl. 260-239.30R.
Shannon, William H.; and Sutton, Wesley D., Jr., to Game Time, Inc. Seat for recreational swing set. 4,524,966, Cl. 272-85.000.
Sharma, Ram A., to General Motors Corporation. Decontamination of aluminum by chlorination. 4,525,212, Cl. 75-68.00R.
Sharp, Bruce R. Storage tank systems. 4,524,609, Cl. 73-49.200.
Sharp Kabushiki Kaisha: *See*—
Mori, Yuichirou, 4,525,726, Cl. 346-75.000.
Shell Oil Company: *See*—
Harris, Martin, 4,525,474, Cl. 514-226.000.
Kollmeyer, Willy D.; and Brown, Thomas L., 4,525,201, Cl. 71-76.000.
Payne, George B.; and Powell, James E., 4,525,203, Cl. 71-88.000.
Stevens, James W.; and Ayers, Ray R., 4,525,101, Cl. 405-169.000.
Shelton, Russell S.: *See*—
Morris, Robert C.; and Shelton, Russell S., 4,524,539, Cl. 43-44.870.
Sheng, Shih Y.; and York, Ray A., to Parker Hannifin Corporation. Force motor with ball mounted armature. 4,525,695, Cl. 335-262.000.
Sheppard, Donald A.: *See*—
Prosan, Richard; Hair, James M., III; and Sheppard, Donald A., 4,525,805, Cl. 364-900.000.
Sheridan, Roger D.: *See*—
DeWerth, Douglas W.; and Sheridan, Roger D., 4,525,141, Cl. 431-347.000.
Shibata, Makoto: *See*—
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.
Shibata, Mitsuyoshi: *See*—
Berry, Milton E.; and Shibata, Mitsuyoshi, 4,524,821, Cl. 164-482.000.
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, to Toyo Contact Lens Co.; and Shin-Etsu Chemical Co., Ltd. Oxygen permeable soft contact lens composition. 4,525,563, Cl. 526-279.000.
Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,525,506, Cl. 524-102.000.
Shigematsu, Kazuo: *See*—
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.
Shigemoto, Shigeru: *See*—
Ohmura, Yasuhiro; Maruyama, Seiichiro; and Shigemoto, Shigeru, 4,525,529, Cl. 525-64.000.

Shikatani, Yutaka: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,525,552, Cl. 526-116.000.

Shimanuki, Koji: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, 4,525,742, Cl. 358-213.000.

Shimbara, Sakuzo: *See*—
Sato, Youji; Omata, Nobuaki; and Shimbara, Sakuzo, 4,524,494, Cl. 24-453.000.

Shimeki, Yasuharu; Kato, Misao; Matsushima, Hiroshi; and Ishikawa, Toshiro, to Matsushita Electric Industrial Company, Limited. Circuit arrangement and method for magnetic recording/reproducing. 4,525,753, Cl. 360-45.000.

Shimizu, Fumio: *See*—
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, 4,525,300, Cl. 260-112.50R.

Shimizu, Kiyoshi: *See*—
Hayashi, Ikuo; Itikawa, Tadao; Ogihara, Keizo; and Shimizu, Kiyoshi, 4,525,576, Cl. 528-313.000.

Shimizu, Kyozo: *See*—
Chiba, Fumitaka; and Shimizu, Kyozo, 4,525,809, Cl. 365-51.000.

Shimizu, Takahiko; Fukui, Hishao; and Kohno, Tadashi, to Pentel Kabushiki Kaisha. Tubular writing tip having an outer reduced diameter portion. 4,525,092, Cl. 401-265.000.

Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, to G-C Dental Industrial Corporation. Dental cement. 4,524,824, Cl. 106-35.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,525,563, Cl. 526-279.000.

Shingaki, Seiichi: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,525,189, Cl. 65-3.150.

Shioi, Keiko; and Nakanishi, Mikihiko, to Sakura Color Products Corp. Ink composition. 4,525,215, Cl. 106-22.000.

Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, to Kanzaki Paper Manufacturing Company, Ltd. Method of preparing microcapsules. 4,525,520, Cl. 524-512.000.

Shiokama, Yoshiharu; and Suzuki, Shigeru, to Nippon Kogaku K.K. Motor-drivable photographing lens assembly. 4,525,053, Cl. 354-400.000.

Shionogi & Co., Ltd.: *See*—
Narisada, Masayuki; Watanabe, Fumihiko; Okada, Tetsuo; and Matsumura, Hiromu, 4,525,355, Cl. 514-210.000.

Shipley Company Inc.: *See*—
Valayil, Silvester P.; and Aronson, Vita, 4,525,759, Cl. 360-135.000.

Shipos, Louis E.; and Tinker, Steven I., to NCR Corporation. Compact rotary knife mechanism. 4,525,088, Cl. 400-621.000.

Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Photoconductive member containing an amorphous boron layer. 4,525,442, Cl. 430-57.000.

Shiraishi, Yoshinobu: *See*—
Kamada, Kazumasa: Tamai, Katsumi; Abe, Kazunori; and Shiraishi, Yoshinobu, 4,525,537, Cl. 525-198.000.

Shiratani, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Radio receiver. 4,525,867, Cl. 455-194.000.

Shirley, Donald J.; and Owen, Thomas E., to Southwest Research Institute. Cylindrical bender-type vibration transducer. 4,525,645, Cl. 310-337.000.

Sias, Robert G.: *See*—
Hayes, Daniel F.; Sias, Robert G.; Chesney, Lloyd; and Waldron, John W., 4,525,253, Cl. 204-149.000.

Siccardi, Frank J. Livestock enclosure environmental control method. 4,524,722, Cl. 119-21.000.

Sieben, Joannes H. F. C., to U.S. Philips Corporation. Magnetic-tape cassette with a flexible latch for a cover. 4,524,927, Cl. 242-198.000.

Siegele, Dieter: *See*—
Scheicher, Hans; Siegele, Dieter; and Soltesz, Uwe, 4,525,145, Cl. 433-173.000.

Sielfeld, Gilbert; and de Jong, Rudolf, to Chemische Werke Huels AG. Suspension polymerization of vinyl chloride wherein suspension agent is added after the monomer charge. 4,525,559, Cl. 526-200.000.

Siemens Aktiengesellschaft: *See*—
Baues, Peter, 4,525,873, Cl. 455-600.000.
Baues, Peter, 4,525,874, Cl. 455-600.000.
Brajder, Antonio, 4,525,765, Cl. 361-88.000.
Fleischer, Wolfgang; Eichelberger, Leo; and Endress, Georg, 4,524,808, Cl. 138-103.000.
Schwabe, Ulrich; Jacobs, Erwin P.; and Neppl, Franz, 4,525,378, Cl. 427-38.000.
Wolf, Gerhard, 4,525,849, Cl. 375-118.000.

Silva, Rosemary A. Needle keeper device. 4,524,891, Cl. 223-109.00R.

Silverman, Harold; Ramsey, James S.; and Irvine, Robert, to Pitney Bowes Inc. Sheet processing apparatus. 4,524,557, Cl. 53-55.000.

Silverwater, Bernard, to Pall Corporation. Automatic reservoir bleed valve. 4,524,793, Cl. 137-198.000.

Simard, Patrice. Safety valve for automatically stopping the flow of a fluid brought by a conduit to a reservoir. 4,524,798, Cl. 137-448.000.

Simmons, Clarke V. Polarizing retroreflecting prism. 4,525,034, Cl. 350-395.000.

Simmons, Nathaniel; and Parikh, Kamal I., to GTE Automatic Electric Inc. Interface arrangement for buffering communication information between a transmitting and receiving stage of a time-space-time digital switching system. 4,525,831, Cl. 370-63.000.

Simon, Paul R.: *See*—
Flassayer, Claude; Le Grives, Bernard; and Simon, Paul R., 4,525,238, Cl. 156-645.000.

Simon, Walter: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Simonelli, Robert J.: *See*—
Russell, Frank S.; and Simonelli, Robert J., 4,524,597, Cl. 72-135.000.

Simonton, Robert D. Connector aperture seal for a galvanic cell. 4,525,439, Cl. 429-162.000.

Simpson, Harold G., to Encon Products, Inc. Structural bracing system. 4,524,554, Cl. 52-693.000.

Simpson, Raymond W., to Prutec Limited. Manchester decoder. 4,525,848, Cl. 375-87.000.

Singer Company, The: *See*—
Rodda, Donald; and Odermann, Charles R., 4,524,708, Cl. 112-231.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred, 4,524,855, Cl. 192-88.00A.
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Hans, Rudiger, 4,525,082, Cl. 384-138.000.

Slavens, Clyde M., to Evans Pipeline Equipment Company. Internal pipe welding apparatus. 4,525,616, Cl. 219-60.00R.

Slavik, William H.; and Huber, William B., to Nuvatec, Inc. Intravenous set flow control device. 4,525,163, Cl. 604-65.000.

Sleeper & Hartley Corp.: *See*—
Russell, Frank S.; and Simonelli, Robert J., 4,524,597, Cl. 72-135.000.

Slik Tripod Co., Ltd.: *See*—
Kosugi, Yoshinobu; and Tachibana, Kaoru, 4,525,052, Cl. 354-293.000.

Smalley, Daniel S. Induction furnace monitor. 4,525,665, Cl. 324-52.000.

Smeets, Andreas L. M. T.: *See*—
van den Wildenberg, Adrianus M. M.; and Smeets, Andreas L. M. T., 4,524,747, Cl. 123-557.000.

Smith, Douglas D., to United States of America, Energy. Apparatus for accurately measuring high temperatures. 4,525,080, Cl. 374-115.000.

Smith, Durward A.: *See*—
Harris, Hubert; and Smith, Durward A., 4,524,681, Cl. 99-474.000.

Smith, Edward F., III: *See*—
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,525,422, Cl. 428-418.000.

Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., to Interox Chemicals Limited. Liquid detergent compositions. 4,525,291, Cl. 252-95.000.

Smith, Harrison C., to Tele-Drill, Inc. Toroidal coupled telemetry apparatus. 4,525,715, Cl. 340-854.000.

Smith International, Inc.: *See*—
Barron, Charles D.; and Kuus, Felix, 4,524,834, Cl. 166-385.000.
Hertz, Daniel L., Jr., 4,524,981, Cl. 277-210.000.

Smith, James, to U.S. Philips Corporation. Modular display apparatus with means for preventing brightness variations. 4,525,653, Cl. 315-366.000.

Smith Kline & French Laboratories Limited: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,525,477, Cl. 514-333.000.

Smith, Philip S.; and Gallup, Michael G., to Motorola Inc. Frequency generator circuit. 4,525,851, Cl. 377-110.000.

Smith, Richard L. Solution polymerization of conjugated dienes. 4,525,560, Cl. 526-201.000.

Smith, Stuart B., to Thermocell Development, Ltd. High tear strength flexible urethane foam composition and method of preparation. 4,525,490, Cl. 521-124.000.

Smiths Industries Public Limited Company: *See*—
Clinton, Peter, 4,525,792, Cl. 364-509.000.

Smoyer, Bruce A.: *See*—
Galla, Edward A.; and Smoyer, Bruce A., 4,525,316, Cl. 264-54.000.

Snyder, William J.; Miller, Raymond H.; and Kobayashi, Hisashi, to Union Carbide Corporation. Flame signal enhancer for post-mixed burner. 4,525,138, Cl. 431-187.000.

Societe Anonyme des Produits Ceramiques de Touraine: *See*—
Genetay, Michel; and Dangers, Gerard, 4,524,500, Cl. 29-157.00R.

Societe Anonyme dite: Institut Merueux: *See*—
Montagnon, Bernard J.; and Fanget, Bernard J. C., 4,525,349, Cl. 424-89.000.

Societe d'Exploitation des Procedes Marechal: *See*—
Le Magourou, Yves, 4,525,610, Cl. 200-51.130.

Societe E. Lacroix-Tous Artifices: *See*—
Billard, Alain A.; Santalucia, Andre R.; and Breseghello, Christian, 4,524,670, Cl. 89-1.530.

Societe Nationale des Poudres et Explosifs: *See*—
Ropars, Marcel; and Bloch, Bertrand, 4,525,573, Cl. 528-232.000.

Soderberg, John H.; Eckert, Alton B.; and McFiggans, Robert B., to Pitney Bowes Inc. Electronic postage meter having plural computing system. 4,525,785, Cl. 364-464.000.

Soderberg, John H.: *See*—
Crowley, Raymond R.; and Soderberg, John H., 4,525,786, Cl. 364-466.000.

Solari, Marcello: *See*—
Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, 4,525,466, Cl. 502-63.000.

Soled, Stuart L.; Wold, Aaron; and Kershaw, Robert, to Exxon Research & Engineering Co. Reduction process for forming powdered alloys from mixed metal iron oxides. 4,525,206, Cl. 75-0.5BA.

Solomon, C. Ashley: *See—*
Cascone, Ronald F.; and Solomon, C. Ashley, 4,524,581, Cl. 60-39.020.

Solt, Paul E.: *See—*
DiBuo, Louis J.; Solt, Paul E.; and Souders, Marvyn L., 4,525,106, Cl. 406-60.000.

Soltesz, Uwe: *See—*
Scheicher, Hans; Siegele, Dieter; and Soltesz, Uwe, 4,525,145, Cl. 433-173.000.

Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, to Nippon Kayaku Kabushiki Kaisha. Water-insoluble biospecific absorbent containing arginal derivative. 4,525,465, Cl. 502-7.000.

Someya, Hiromi; Aihara, Yoshihiko; Mizogui, Toyokazu; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Camera. 4,525,054, Cl. 354-443.000.

Son, Adelina J.; and Loftin, Royal E., to Halliburton Company. Method of preventing loss of an oil-base drilling fluid during the drilling of an oil or gas well into a subterranean formation. 4,525,285, Cl. 252-8.50M.

Sone, Takanori: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,525,589, Cl. 544-128.000.

Sony Corporation: *See—*
Nakane, Yasuaki; Akamatsu, Junichi; Sakamoto, Susumu; and Kiyomiya, Tadashi, 4,525,412, Cl. 428-199.000.
Nemoto, Tsuneo; and Sugawara, Kokichi, 4,524,926, Cl. 242-198.000.
Watanabe, Nobuhiko; and Tanaka, Masato, 4,525,752, Cl. 360-13.000.
Yokoya, Satoshi, 4,525,686, Cl. 331-17.000.

Souders, Marvyn L.: *See—*
DiBuo, Louis J.; Solt, Paul E.; and Souders, Marvyn L., 4,525,106, Cl. 406-60.000.

Southard, James S. Alternating current switching device. 4,525,634, Cl. 307-115.000.

Southwest Research Institute: *See—*
Hall, Charles W.; and Anderson, Orin M., 4,524,466, Cl. 603-3.000.
Shirley, Donald J.; and Owen, Thomas E., 4,525,645, Cl. 310-337.000.

Southwire Company: *See—*
Berry, Milton E.; and Shibata, Mitsuyoshi, 4,524,821, Cl. 164-482.000.

Spector, George: *See—*
Diaz, Joe; and Spector, George, 4,524,649, Cl. 81-57.130.

Spectracom Corp.: *See—*
Hesselberth, Robert J.; Donaher, Thomas P.; and Sandahl, Joel E., 4,525,685, Cl. 331-10.000.

Speer, Billy L.; Burris, Lee R.; and Rogers, Jerry W., to Dayco Corporation. Belt tensioner and method of making the same. 4,525,152, Cl. 474-133.000.

Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,525,488, Cl. 521-164.000.

Sperry Corporation: *See—*
Kush, Stephen T.; and Meffe, Marc E., 4,525,626, Cl. 250-227.000.

Sperzel, Wolfgang; and Sturmer, Johann, to Leybold-Heraeus GmbH. Auxiliary-voltage source for supplying electric circuits which are at a high potential. 4,525,652, Cl. 315-307.000.

Spilker, Harry; and Einfeld, Klaus, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Dry storage facility for irradiated nuclear reactor fuel elements. 4,525,324, Cl. 376-272.000.

Spinner, Joseph R., to King-Seeley Thermos Company. Ice making apparatus. 4,525,073, Cl. 366-323.000.

Spisak, Andrew J.: *See—*
Humphries, Benjamin T.; and Spisak, Andrew J., 4,525,642, Cl. 310-260.000.

Spitzer, Wayne A.: *See—*
Hall, David A.; and Spitzer, Wayne A., 4,525,304, Cl. 260-245.400.

Spoor, Herbert: *See—*
Blum, Rainer; Spoor, Herbert; Osterloh, Rolf; Mosler, Gerhard; and Rubbert, Bernhard, 4,525,570, Cl. 528-75.000.

Spraymation, Inc.: *See—*
Cocks, Eric H., 4,524,887, Cl. 222-146.500.

Spreadbury, Robert J.: *See—*
Hicks, John M.; Engel, Joseph C.; Spreadbury, Robert J.; Elms, Robert T.; and Saletta, Gary F., 4,525,650, Cl. 315-226.000.

Sprenger, Glenn R.: *See—*
Knudtson, Lynn A.; and Sprenger, Glenn R., 4,524,628, Cl. 73-863.430.

Sresty, Guggilam C.: *See—*
Bridges, Jack E.; Taflove, Allen; and Sresty, Guggilam C., 4,524,827, Cl. 166-248.000.

Srivastava, Gopal K.: *See—*
Lai, Stephen H.; and Srivastava, Gopal K., 4,525,682, Cl. 330-288.000.

Staba, E. John: *See—*
Zito, Santo W.; and Staba, E. John, 4,525,455, Cl. 435-135.000.

Stackhouse, Bill L., to General Electric Company. Voice-responsive mobile status unit. 4,525,793, Cl. 364-513.500.

Stadelmaier, Robert A.: *See—*
Zawadzki, Stanley C., Jr.; Stadelmaier, Robert A.; and Perrone, John J., 4,525,100, Cl. 405-129.000.

Staffa, Karl-Heinz: *See—*
Hummel, Karl-Ernst; Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,524,823, Cl. 165-174.000.

Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., to Procedyne Corp. Apparatus for metal treatment. 4,524,957, Cl. 266-252.000.

Standard Oil Company, The: *See—*
Bremer, Noel J.; Dria, Dennis E.; Milberger, Ernest C.; Blum, Patricia R.; and Nicholas, Mark L., 4,525,471, Cl. 502-209.000.
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,525,578, Cl. 528-354.000.

Standard Register Company, The: *See—*
Vath, F. Leo, 4,524,903, Cl. 229-73.000.

Standard Telephones and Cables plc: *See—*
Alexander, John H., 4,525,767, Cl. 361-321.000.
Jones, Stephen R., 4,525,312, Cl. 264-1.500.
Wheeler, Jennifer M., 4,525,768, Cl. 361-321.000.

Standard-Thomson Corporation: *See—*
Wong, Backman, 4,524,907, Cl. 236-34.500.

Standley, Paul M.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,525,150, Cl. 474-93.000.

Standley, Rosalie K. Rosette bow. 4,525,394, Cl. 428-26.000.

Stani vyzkumny ustav materoalu: *See—*
Landa, Vaclav; and Vitek, Jaromir, 4,525,248, Cl. 204-29.000.

Stanley Works, The: *See—*
West, Robert F., 4,524,518, Cl. 30-330.000.

Stark, Raymond L., to Alcon Laboratories, Inc. Aqueous antimicrobial ophthalmic solutions. 4,525,346, Cl. 424-80.000.

Staudte, Juergen H., to Piezoelectric Technology Investors, Limited. Vibratory angular rate sensor system. 4,524,619, Cl. 73-505.000.

Stauffer Chemical Company: *See—*
Felix, Raymond A., 4,525,311, Cl. 260-940.000.
Knudtson, Lynn A.; and Sprenger, Glenn R., 4,524,628, Cl. 73-863.430.
Large, George B.; and Buren, Lawrence L., 4,525,202, Cl. 71-86.000.

Stegenga, Philip D.: *See—*
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.

Stellaccio, Robert J., to Texaco Inc. High turn down burner for partial oxidation of slurries of solid fuel. 4,525,175, Cl. 48-86.00R.

Stemmler, Bruno; and Zeilinger, Hans, to Aktiengesellschaft M.A.N. Maschinenfabrik Augsburg-Nurnberg. Method for conveying and treating a gas employed for the coating of workpieces by means of a chemical, heterogeneous vapor-phase reaction. 4,525,389, Cl. 427-255.100.

Stephan, Peter, to Bergwerksverband GmbH. Roof support for tunnel excavator. 4,525,104, Cl. 405-290.000.

Sterbik, William G. Grip-correcting golf club handle. 4,524,973, Cl. 273-183.00D.

Sterimatic Holdings Limited: *See—*
Dent, Hugh R., 4,524,809, Cl. 141-1.000.

Steudler, Frederick W., Jr., to Val Products, Inc. Nipple for feeding liquids to fowl and/or small animals. 4,524,724, Cl. 119-72.500.

Stevens, James W.; and Ayers, Ray R., to Shell Oil Company. Drill string deployment of cable pulling tool. 4,525,101, Cl. 405-169.000.

Stewart, David: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,525,330, Cl. 423-24.000.

Stickles, David L.: *See—*
Homan, Gary R.; and Stickles, David L., 4,525,566, Cl. 528-17.000.

Still, David W.; and Economopoulos, Peter C., to Honeywell Information Systems Inc. Programmable logic array with test capability in the unprogrammed state. 4,525,714, Cl. 340-825.830.

Still, Samuel A., Jr. Realtor sign system. 4,524,533, Cl. 40-607.000.

Stites, Francis H., to GTE Laboratories Incorporated. Solid state transmit/receive switch. 4,525,863, Cl. 455-83.000.

Stojanovski, Stojan. Indexable ball nose end mill. 4,525,110, Cl. 407-40.000.

Stoll, Kurt; and Rudle, Manfred. Spool valve. 4,524,803, Cl. 137-625.640.

Stopinc Aktiengesellschaft: *See—*
Bachmann, Herbert, 4,524,956, Cl. 266-236.000.

Stork PMT B.V.: *See—*
van Mil, Martinus P. G., 4,524,489, Cl. 17-11.000.

Strahs, Martin P.; and Vosbikian, John, to Quickie Manufacturing Corporation. Self contained broom hanging system. 4,524,938, Cl. 248-110.000.

Stroz, John J.: *See—*
D'Amelia, Ronald P.; Stroz, John J.; and White, Roy, 4,525,363, Cl. 426-3.000.

Stuart, James M., to Malvern Scale Company. Electronic scale with non-parallel capacitance means. 4,524,840, Cl. 177-210.00C.

Sturmer, Johann: *See—*
Sperzel, Wolfgang; and Sturmer, Johann, 4,525,652, Cl. 315-307.000.

Suddeutsch Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Hummel, Karl-Ernst; Humpolik, Bohumil; Ingelmann, Hans-Joachim; and Staffa, Karl-Heinz, 4,524,823, Cl. 165-174.000.

Sudo, Chuzo: *See*—
Tsukamoto, Takashi; Sudo, Chuzo; Aihara, Kenji; and Nishimura, Syozi, 4,525,598, Cl. 174-128.00R.
Suenaga, Hideo: *See*—
Sugiyama, Toshio; Suenaga, Hideo; and Fukui, Yukio, 4,525,823, Cl. 369-44.000.
Suga, Akira: *See*—
Hashimoto, Seiji; Suga, Akira; and Tanaka, Nobuyoshi, 4,525,737, Cl. 358-44.000.
Sugano, Haruo: *See*—
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, 4,525,300, Cl. 260-112.50R.
Sugawara, Kokichi: *See*—
Nemoto, Tsuneo; and Sugawara, Kokichi, 4,524,926, Cl. 242-198.000.
Sugi, Nagatoshi: *See*—
Kitahara, Shizuo; and Sugi, Nagatoshi, 4,525,541, Cl. 525-337.000.
Sugihara, Taisuke: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,525,589, Cl. 544-128.000.
Sugioka, Shinji, to Ushio Denki Kabushiki Kaisha. Photochemical vapor deposition apparatus. 4,525,382, Cl. 427-54.100.
Sugioka, Shinji: *See*—
Tanaka, Kazuya; and Sugioka, Shinji, 4,525,381, Cl. 427-54.100.
Sugita, Shoji: *See*—
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, 4,525,555, Cl. 526-125.000.
Sugita, Yutaka: *See*—
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,525,808, Cl. 365-36.000.
Sugiura, Muneharu: *See*—
Fujibayashi, Kazuo; Sugiura, Muneharu; and Tsuji, Sadahiko, 4,525,036, Cl. 350-427.000.
Sugiyama, Toshio; Suenaga, Hideo; and Fukui, Yukio, to Hitachi, Ltd. Optical tracking system. 4,525,823, Cl. 369-44.000.
Sulzer Brothers Limited: *See*—
Ammann, Heinz, 4,524,727, Cl. 122-235.00A.
Sumitomo Chemical Co., Ltd.: *See*—
Yachigo, Shinichi; Ishii, Tamaki; Takahashi, Yukoh; and Terada, Yutaka, 4,525,514, Cl. 524-291.000.
Sumitomo Metal Industries, Ltd.: *See*—
Tsukamoto, Takashi; Sudo, Chuzo; Aihara, Kenji; and Nishimura, Syozi, 4,525,598, Cl. 174-128.00R.
Sumitomo Metal Mining Company Limited: *See*—
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, 4,525,208, Cl. 75-25.000.
Sunnen Products Company: *See*—
Sunnen, Robert M.; and Estes, Morton B., 4,524,549, Cl. 51-347.000.
Sunnen, Robert M.; and Estes, Morton B., to Sunnen Products Company. Honing head construction. 4,524,549, Cl. 51-347.000.
Surjaatmadja, Jim B.: *See*—
Mosier, John E.; Surjaatmadja, Jim B.; McLawhon, George B.; and Gallup, Jeffrey M., 4,525,804, Cl. 364-900.000.
Surprenant, Richard P., to General Electric Company. Composition for promoting adhesion of curable silicones to substrates. 4,525,400, Cl. 428-54.000.
Susi, Michael F.: *See*—
Leunig, Carl V.; and Susi, Michael F., 4,524,614, Cl. 73-147.000.
Sussman, Howard. Plant-watering device. 4,524,944, Cl. 251-6.000.
Sutliff, Wayne N., to Downen, Jim L. Oil well jar. 4,524,838, Cl. 175-297.000.
Sutton Laboratories, Inc.: *See*—
Berke, Philip A.; and Rosen, William E., 4,525,480, Cl. 514-544.000.
Sutton, Wesley D., Jr.: *See*—
Shannon, William H.; and Sutton, Wesley D., Jr., 4,524,966, Cl. 272-85.000.
Suyama, Satoshi: *See*—
Nakagawa, Koichiro; Suyama, Satoshi; Yanagi, Masahiro; and Nakajima, Yasutaka, 4,525,758, Cl. 360-133.000.
Suzuki, Hideo: *See*—
Tomisawa, Norio; Uchiyama, Yasuji; and Suzuki, Hideo, 4,524,668, Cl. 84-1.240.
Suzuki, Hirosuke; and Ohki, Hajime, to Junkosha Company Ltd. Transmission line of unsintered PTFE having sintered high density portions. 4,525,693, Cl. 333-236.000.
Suzuki, Kazumoto: *See*—
Saito, Takashi; Suzuki, Kazumoto; and Naganuma, Yoshihiro, 4,525,432, Cl. 428-653.000.
Suzuki, Migaku; Ochi, Mitsuzo; and Nozaki, Satoshi, to UniCharm Corporation. Method for attaching elastic band to sanitary articles. 4,525,229, Cl. 156-161.000.
Suzuki, Munehiro: *See*—
Kimpara, Masaomi; and Suzuki, Munehiro, 4,525,200, Cl. 71-76.000.
Suzuki, Nobuyuki: *See*—
Someya, Hiromi; Aihara, Yoshihiko; Mizogui, Toyokazu; and Suzuki, Nobuyuki, 4,525,054, Cl. 354-443.000.
Suzuki, Norio; Kajikawa, Hiroshi; and Nishikawa, Tadashi, to Kabushiki Kaisha Kobe Seiko Sho. Method and apparatus of ultrasonic flaw detection. 4,524,622, Cl. 73-620.000.
Suzuki, Ryo: *See*—
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,525,808, Cl. 365-36.000.
Suzuki, Shigeru: *See*—
Shiokama, Yoshiharu; and Suzuki, Shigeru, 4,525,053, Cl. 354-400.000.
Suzuki, Shingo: *See*—
Inoue, Masao; Suzuki, Shingo; and Gotoh, Hajime, 4,525,029, Cl. 350-128.000.
Suzuki, Takashi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,525,700, Cl. 340-518.000.
Suzuki, Yoshiharu: *See*—
Hotta, Hiroshi; and Suzuki, Yoshiharu, 4,525,261, Cl. 204-192.0EC.
Suzuki, Yosihide, to Komori Printing Machinery Co., Ltd. Paper discharge apparatus for use in paper folders of rotary presses. 4,524,961, Cl. 270-4.000.
Svensson, Sven A. T., to Duni Bila AB. Absorption pad. 4,524,474, Cl. 5-484.000.
Svoboda, Josef; Himmetsberger, Alois; and Szabo, Emilie, to TMC Corporation. Adjusting mechanism. 4,524,990, Cl. 280-633.000.
Swimaid, Inc.: *See*—
Henson, James H., 4,525,272, Cl. 210-149.000.
Swinkels, Godefridus M.: *See*—
Boateng, Daniel A. D.; Ball, Donald L.; and Swinkels, Godefridus M., 4,525,332, Cl. 423-89.000.
Swiss Aluminium Ltd.: *See*—
Jaggi, Ernst, 4,525,105, Cl. 406-50.000.
Schwellinger, Pius; Ried, Alois; Timm, Jurgen; and Heckler, Manfred, 4,525,326, Cl. 420-535.000.
Swiss-Tex, Incorporated: *See*—
Graham, John W., 4,524,484, Cl. 16-115.000.
Syracuse University: *See*—
Schwarz, James A.; and Pasco, Robert W., 4,525,734, Cl. 357-67.000.
Szabo, Emilie: *See*—
Svoboda, Josef; Himmetsberger, Alois; and Szabo, Emilie, 4,524,990, Cl. 280-633.000.
T.A.D. Avanti, Inc.: *See*—
Bond, Raymond G., 4,525,603, Cl. 179-84.00R.
T. Giusti & Son Ltd.: *See*—
Giusti, Raolo B., 4,525,072, Cl. 366-168.000.
T. J. Electronics: *See*—
Holman, Howard E.; and Turner, Roy D., 4,525,014, Cl. 339-14.00R.
Tabet, Mansour: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,525,135, Cl. 425-290.000.
Tachibana, Kaoru: *See*—
Kosugi, Yoshinobu; and Tachibana, Kaoru, 4,525,052, Cl. 354-293.000.
Tada, Tetsuya, to Canyon Corporation. Dispenser. 4,524,888, Cl. 222-153.000.
Taflove, Allen: *See*—
Bridges, Jack E.; Taflove, Allen; and Sresty, Guggilam C., 4,524,827, Cl. 166-248.000.
Tagashira, Yoshimi: *See*—
Atobe, Masaaki; and Tagashira, Yoshimi, 4,525,676, Cl. 329-50.000.
Tagawa, Kenichi: *See*—
Hagiwara, Zenji; Ohki, Hideo; Hoshino, Shigetaka; Nohara, Saburo; Ida, Shunya; and Tagawa, Kenichi, 4,525,410, Cl. 428-198.000.
Taguchi, Atsushi; and Ohmiya, Takeo, to Daicel Chemical Industries, Ltd. Sodium carboxymethylcellulose. 4,525,585, Cl. 536-98.000.
Tajima, Fujio; and Hirai, Hiromu, to Hitachi, Ltd. Tape transport control unit. 4,525,654, Cl. 318-7.000.
Tajima, Yoshio; Miyoshi, Mituji; Sugita, Shoji; Kawabe, Kiyoshi; and Matsuura, Kazuo, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,525,555, Cl. 526-125.000.
Tajiri, Norikiyo: *See*—
Hatano, Hideki; Tajiri, Norikiyo; Otaki, Sakashi; and Kato, Shigeru, 4,525,824, Cl. 369-45.000.
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, to Dainippon Ink and Chemicals Inc. Process for preparation of steroids. 4,525,303, Cl. 260-239.55R.
Takagi, Tsuneo; and Yonehara, Hiroyuki, to Dainippon Screen Seizo Kabushiki Kaisha. Method for controlling an exposure time in consideration of the reciprocity law failure of a photosensitive material. 4,525,065, Cl. 355-77.000.
Takahashi, Hiroyoshi: *See*—
Yamamoto, Jun; Hayashida, Hajime; and Takahashi, Hiroyoshi, 4,524,669, Cl. 84-433.000.
Takahashi, Iwashige: *See*—
Nishikawa, Yoshinori; and Takahashi, Iwashige, 4,525,706, Cl. 340-679.000.
Takahashi, Norimichi: *See*—
Takaoka, Yukio; Morizumi, Masaaki; and Takahashi, Norimichi, 4,525,046, Cl. 354-149.110.
Takahashi, Yukoh: *See*—
Yachigo, Shinichi; Ishii, Tamaki; Takahashi, Yukoh; and Terada, Yutaka, 4,525,514, Cl. 524-291.000.
Takahata, Kei; Murasawa, Sadao; Ichida, Hiroshi; Okada, Mizuho; and Nakayama, Takao, to Ishihara Sangyo Kaisha, Ltd. Multicolor electrophotographic process using TiO_2. 4,525,441, Cl. 430-46.000.
Takai, Kazuki; Hakumoto, Mitsuhiro; and Yamada, Yasuo, to Clarion Co., Ltd. Head shift mechanism. 4,525,756, Cl. 360-75.000.

Takamatsu, Takeshi: *See*—
Hattori, Shinichiro; Hosoda, Seiichi; and Takamatsu, Takeshi, 4,524,761, Cl. 128-6.000.

Takamura, Koji: *See*—
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.

Takano, Hiroji: *See*—
Hara, Yoshihumi; Takano, Hiroji; Kabashima, Shoshi; and Hasegawa, Mikio, 4,524,507, Cl. 29-564.200.

Takaoka, Yukio; Morizumi, Masaaki; and Takahashi, Norimichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Caseless camera. 4,525,046, Cl. 354-149.110.

Takasa, Kenji; and Nakamura, Masakatsu, to Asahi Kasei Kogyo Kabushiki Kaisha. Pressure-resistant paper vessel. 4,525,396, Cl. 428-35.000.

Takebe, Kaoru: *See*—
Tanaka, Susumu; and Takebe, Kaoru, 4,525,447, Cl. 430-122.000.

Takebe, Katuhiko, to Rhythm Watch Company Limited. Vocal announcing device for electronic timepiece. 4,525,076, Cl. 368-63.000.

Takeda Chemical Industries, Ltd.: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,525,361, Cl. 514-689.000.

Takeda, Hisao; and Taniguchi, Yasunori, to American Colloid Company. Production process for highly water absorbable polymer. 4,525,527, Cl. 524-831.000.

Takeshita, Masatoshi: *See*—
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,525,808, Cl. 365-36.000.

Takeuchi, Kiyoshi, to Nissan Motor Company, Limited. Pressure sensor. 4,524,625, Cl. 73-754.000.

Takeuchi, Teruaki: *See*—
Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,525,808, Cl. 365-36.000.

Takeuchi, Tomio: *See*—
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.
Umezawa, Hamao; Takeuchi, Tomio; and Kondo, Shinichi, 4,525,299, Cl. 260-112.50R.

Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, to Toyo Stauffer Chemical Co., Ltd. Catalytic component for polymerization of α-olefin and method for homo- or co-polymerization of α-olefin. 4,525,558, Cl. 526-142.000.

Takuya, Suzuki, to Nippon Gakki Seizo Kabushiki Kaisha. Acoustic resistor in an electroacoustic transducer. 4,525,817, Cl. 367-140.000.

Tamai, Katsumi: *See*—
Kamada, Kazumasa; Tamai, Katsumi; Abe, Kazunori; and Shiraishi, Yoshinobu, 4,525,537, Cl. 525-198.000.

Tamamushi, Takashige: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, 4,525,742, Cl. 358-213.000.

Tamari, Nobuyuki: *See*—
Ebata, Yoshihiro; Tamari, Nobuyuki; Toibana, Yasuo; and Hayami, Ryozo, 4,525,387, Cl. 427-190.000.

Tan, Yoichi; and Miyao, Fumio, to Fuji Xerox Co., Ltd. Digital signal transmission system. 4,525,837, Cl. 370-85.000.

Tanaka, Hideki; Kamimura, Masanori; Horikawa, Koji; and Kawasaki, Katsuyuki, to Mazda Motor Corporation. Belt-pulley drive mechanism. 4,525,158, Cl. 474-167.000.

Tanaka, Kazuya; and Sugioka, Shinji, to Ushio Denki Kabushiki Kaisha. Photochemical vapor deposition apparatus. 4,525,381, Cl. 427-54.100.

Tanaka, Masaru; Noguchi, Naoki; Yoshino, Kenji; and Saitoh, Osamu, to Horiba, Ltd. Optical absorption analyzer. 4,525,069, Cl. 356-435.000.

Tanaka, Masato: *See*—
Watanabe, Nobuhiko; and Tanaka, Masato, 4,525,752, Cl. 360-13.000.

Tanaka, Minoru; and Kawabe, Tadashi, to Tateho Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing crystalline silicon nitride and method of separation thereof. 4,525,335, Cl. 423-344.000.

Tanaka, Nobuyoshi: *See*—
Hashimoto, Seiji; Suga, Akira; and Tanaka, Nobuyoshi, 4,525,737, Cl. 358-44.000.

Tanaka, Seiichi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,525,700, Cl. 340-518.000.

Tanaka, Susumu; and Takebe, Kaoru, to Minolta Camera Kabushiki Kaisha. Image forming method using three component developer. 4,525,447, Cl. 430-122.000.

Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, to Mitsubishi Chemical Industries Ltd. Process for polymerizing olefin. 4,525,554, Cl. 526-124.000.

Tanaka, Toshie, to Nifco Inc. Lid lock structure. 4,525,004, Cl. 292-171.000.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Starter motor for an internal combustion engine. 4,525,632, Cl. 290-38.00R.

Tanaka, Yasuyuki: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, 4,525,303, Cl. 260-239.55R.

Tani, Haruhisa: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.

Taniguchi, Yasunori: *See*—
Takeda, Hisao; and Taniguchi, Yasunori, 4,525,527, Cl. 524-831.000.

Tassicker, Owen J., to Electric Power Research Institute, Inc. Vertically tiered particle filtering apparatus. 4,525,184, Cl. 55-302.000.

Tate, John L., Jr. Knotting device. 4,525,003, Cl. 289-17.000.

Tateho Kagaku Kogyo Kabushiki Kaisha: *See*—
Tanaka, Minoru; and Kawabe, Tadashi, 4,525,335, Cl. 423-344.000.

Tatsumi, Takumi, to Mitsubishi Denki Kabushiki Kaisha. Speed change control unit of automatic transmission for automobiles utilizing fluid flow rate. 4,524,645, Cl. 74-866.000.

Tatsuno, Kimio; and Saito, Susumu, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Two-beam scanning optical system. 4,525,024, Cl. 350-6.500.

Tavernier, Serge M.: *See*—
De Roo, Pierre R.; and Tavernier, Serge M., 4,525,445, Cl. 430-109.000.

Taylor, Julian S. Engine oil sampling device. 4,524,811, Cl. 141-325.000.

TDK Corporation: *See*—
Ishino, Ken; and Hashimoto. Yasuo, 4,525,614, Cl. 219-10.55D.

TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Robra, Joerg; and Goschin, Hans, 4,525,602, Cl. 179-16.00F.

Technochemie Kessler & Co. GmbH: *See*—
Fleischer, Wolfgang; Eichelberger, Leo; and Endress, Georg, 4,524,808, Cl. 138-103.000.

Teepak, Inc.: *See*—
Liekens, J. Alfons F.; and Hendriks, Ivo G. M., 4,524,561, Cl. 53-397.000.

Tehsildar, Tehmtan J.; and Colbert, Robert R., to Boyertown Casket Company. Casket stay mechanism. 4,524,496, Cl. 27-18.000.

Teijin Limited: *See*—
Aoki, Akihiro; Hiratsuka, Shozaburo; Yamaguchi, Norihisa; and Makino, Shoji, 4,525,384, Cl. 427-174.000.

Tektronix, Inc.: *See*—
Murphy, Desmond L.; and Wimmer, Warren K., 4,525,688, Cl. 333-81.00R.

TELDEC Telefunken - Decca Schallplatten GmbH: *See*—
Redlich, Horst, 4,525,827, Cl. 369-72.000.

Tele-Drill, Inc.: *See*—
Smith, Harrison C., 4,525,715, Cl. 340-854.000.

Telefunken Electronic GmbH: *See*—
Pschunder, Willi, 4,525,594, Cl. 136-256.000.

Telmec Co., Ltd.: *See*—
Imahashi, Issei; and Asakawa, Teruo, 4,525,659, Cl. 318-649.000.

Templin, Frank C., to Zenith Electronics Corporation. Stack memory tuning. 4,525,866, Cl. 455-186.000.

ten Broeke, Klaas E.; and Kohler, Manfred R., to American Pecco Corporation. Tower crane with overbooming protection. 4,524,874, Cl. 212-197.000.

Teo, Lily: *See*—
Davids, Martin; Blackman, Peter; and Teo, Lily, 4,525,779, Cl. 364-200.000.

Terada, Yutaka: *See*—
Yachigo, Shinichi; Ishii, Tamaki; Takahashi, Yukoh; and Terada, Yutaka, 4,525,514, Cl. 524-291.000.

Terasawa, Michio: *See*—
Arizono, Kenzo; Terasawa, Michio; and Nobutoki, Michiharu, 4,525,348, Cl. 424-81.000.

Teratuote Oy: *See*—
Tuomaala, Jorma A. K., 4,524,664, Cl. 83-840.000.

Terwedow, Henry A., Jr.: *See*—
Barer, Sol J.; and Terwedow, Henry A., Jr., 4,525,362, Cl. 514-712.000.

Terwilliger, Richard A., to Diasonics, Inc. Transducer drive assembly. 4,524,623, Cl. 73-633.000.

Tetra Pak Developpement S.A.: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; and Wallich, Manfred, 4,525,318, Cl. 264-259.000.

Tetra Pak International AB: *See*—
Palm, Lars-Erik, 4,524,565, Cl. 53-449.000.

Tex-Tech Industries: *See*—
Leunig, Carl V.; and Susi, Michael F., 4,524,614, Cl. 73-147.000.

Texaco Inc.: *See*—
Curran, Paul F.; and Marshall, Hubert T., II, 4,524,615, Cl. 73-181.000.
Cuscurida, Michael; and Speranza, George P., 4,525,488, Cl. 521-164.000.
Koog, Wolfgang; and Estabrook, Lawrence E., 4,525,176, Cl. 48-197.00R.
Lin, Jiang-Jen; and Knifton, John F., 4,525,481, Cl. 518-700.000.
Rome, Gerald F.; and Lankford, Frank L., Jr., 4,524,952, Cl. 254-269.000.
Savage, Kerry D., 4,524,826, Cl. 166-248.000.
Schlicht, Raymond C., 4,525,288, Cl. 252-32.70E.
Stellaccio, Robert J., 4,525,175, Cl. 48-86.00R.
Vasconcellos, Stephen R.; Yaghmaie, Farrokh; and Howe, Paul E., 4,525,280, Cl. 210-728.000.

Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan, 4,525,732, Cl. 357-13.000.
Lehmann, Randall E.; Brehm, Gailon E.; and Seymour, David J., 4,525,678, Cl. 330-277.000.

Teysseyre, Pierre M.: *See*—
Forestier, Alexandre; Pluquet, Alain A.; Rosa, Roger A.; Tabet, Mansour; and Teysseyre, Pierre M., 4,525,135, Cl. 425-290.000.

Thaler, Warren A.: *See*—
Sartori, Guido; and Thaler, Warren A., 4,525,294, Cl. 252-182.000.

Theeuwes, Felix: *See—*
Urquhart, John; and Theeuwes, Felix, 4,525,162, Cl. 604-56.000.
Theis, Christoph; and Prange, Uwe, to Dynamit Nobel AG. Method of preparing 3-alkoxy acrylonitriles. 4,525,310, Cl. 260-465.600.
Thermocell Development, Ltd.: *See—*
Smith, Stuart B., 4,525,490, Cl. 521-124.000.
Therrien, Roger H.: *See—*
Chahal, Maninderpal S.; and Therrien, Roger H., 4,525,741, Cl. 358-212.000.
Thill, Fernand: *See—*
Goedert, Jean; Thill, Fernand; Henrion, Romain; Klein, Henri; Liesch, Jean-Francois; and Peckels, Jean, 4,524,958, Cl. 266-272.000.
Thistleton, John S., to Clayton Dewandre Co., Ltd. Reciprocating exhauster. 4,525,128, Cl. 417-550.000.
Thomas & Betts Corporation: *See—*
Brandeau, Edward P., 4,524,510, Cl. 29-861.000.
Thomas J. Lipton, Inc.: *See—*
Blemlek, William A., 4,525,371, Cl. 426-557.000.
Thomas, John F., Jr.: *See—*
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Thomas, Ralph D. Snap on device for hardcover ring binder. 4,524,991, Cl. 281-20.000.
Thompson, David F.: *See—*
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,524,499, Cl. 29-156.80B.
Thompson, Donald R.: *See—*
Hoffman, Harry S., Jr.; Thompson, Donald R.; and Zimmerman, Luther L., 4,525,707, Cl. 340-707.000.
Thompson, William E. Ball valve having improved seal means. 4,524,946, Cl. 251-88.000.
Thomson-CSF: *See—*
Hareng, Michel; Hehlen, Robert; Marcenac, Philippe; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean-Noel, 4,525,708, Cl. 340-713.000.
Hareng, Michel; Perbet, Jean-Noel; and Defrance, Michel, 4,525,709, Cl. 340-719.000.
Thorogood, Peter B. Prevention of thrombolic disorder with imidazole derivatives and salts thereof. 4,525,475, Cl. 514-304.000.
Thorsen Tool Company: *See—*
Konecny, James W., 4,524,653, Cl. 81-63.000.
Wenzel, Kenneth G.; and Duke, Jerry R., 4,524,652, Cl. 81-63.000.
Thummler, Ursus: *See—*
Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, 4,525,329, Cl. 422-202.000.
Tiegel Manufacturing Co.: *See—*
Wegner, Paul C., 4,524,509, Cl. 29-623.500.
Tikka, Kyosti, to A. Ahlstrom Osakeyhtio. Sliding two-piece box with tear strip. 4,524,901, Cl. 229-19.000.
Timm, Jurgen: *See—*
Schwellinger, Pius; Ried, Alois; Timm, Jurgen; and Heckler, Manfred, 4,525,326, Cl. 420-535.000.
Timperley, Doreen A.: *See—*
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,525,291, Cl. 252-95.000.
Tinker, Steven I.: *See—*
Shipos, Louis E.; and Tinker, Steven I., 4,525,088, Cl. 400-621.000.
Titchener, Dorothy M.: *See—*
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,525,291, Cl. 252-95.000.
Tito Manzini & Figli S.p.A.: *See—*
Sassi, Carlo, 4,524,563, Cl. 53-426.000.
Titus, Charles H. System for disconnecting an electrical power source from a load. 4,525,764, Cl. 361-42.000.
TMC Corporation: *See—*
Svoboda, Josef; Himmetsberger, Alois; and Szabo, Emilie, 4,524,990, Cl. 280-633.000.
Toda, Shozo; Yasuda, Kenji; and Kokubo, Shozo, to Tokyo Ohka Kogyo Kabushiki Kaisha. Apparatus for separation of immiscible liquids. 4,525,276, Cl. 210-433.200.
Todisco, Joseph, to Marson Corporation. Paper and tape dispensing apparatus. 4,525,235, Cl. 156-511.000.
Toibana, Yasuo: *See—*
Ebata, Yoshihiro; Tamari, Nobuyuki; Toibana, Yasuo; and Hayami, Ryozo, 4,525,387, Cl. 427-190.000.
Tokico Ltd.: *See—*
Sawano, Susumu; Gofuku, Yoshihiro; Hashimoto, Junji; and Ando, Takayuki, 4,524,851, Cl. 188-134.000.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
Toda, Shozo; Yasuda, Kenji; and Kokubo, Shozo, 4,525,276, Cl. 210-433.200.
Tokyo Printing Ink Mfg. Co., Ltd.: *See—*
Yamane, Toshihiro; Ohashi, Kenzi; and Sakaguchi, Toshiharu, 4,525,297, Cl. 252-511.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fujibayashi, Kazuo; Sugiura, Muneharu; and Tsuji, Sadahiko, 4,525,036, Cl. 350-427.000.
Haramaki, Toshio, 4,525,059, Cl. 355-8.000.
Higashiyama, Yasushi; Chiba, Shu; and Sawazaki, Norikazu, 4,525,828, Cl. 369-111.000.
Kawashima, Kazue, 4,525,612, Cl. 200-147.00R.
Masuoka, Fujio, 4,525,811, Cl. 365-154.000.
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.
Saito, Tamio, 4,525,383, Cl. 427-89.000.
Tokyo Sintered Metal Co., Ltd.: *See—*
Hirabayashi, Masao, 4,524,899, Cl. 228-173.200.
Toliusis, Vytautas J., to Humphrey Products Company. Snap-together modular manifold construction. 4,524,807, Cl. 137-884.000.
Tominari, Noboru; and Ishida, Takashi, to Mikuni Kogyo Co., Ltd.; and Tominari, Noboru. Electronic control fuel injection system for spark ignition internal combustion engine. 4,524,745, Cl. 123-478.000.
Tomioka, Kentaro: *See—*
Shimokobe, Hirokata; Saito, Sueo; Tomioka, Kentaro; Akahane, Shoji; and Hirota, Kazuo, 4,524,824, Cl. 106-35.000.
Tomioka, Mitsuharu; and Imajima, Mitsuhiro, to Matsushita Electric Industrial Co., Ltd. Liquid fuel combustion device. 4,525,137, Cl. 431-76.000.
Tomisawa, Norio; Uchiyama, Yasuji; and Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of performing natural slur effect. 4,524,668, Cl. 84-1.240.
Tomita, Tsutomu; Horio, Kimihide; and Naganawa, Tadahisa, to Toyota Jidosha Kabushiki Kaisha. Timing adjustment mechanism in wrapping connector driving device. 4,525,151, Cl. 474-101.000.
Tomiyama, Shunsuke: *See—*
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, 4,525,723, Cl. 346-74.400.
Tomiyasu, Shizuo: *See—*
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,525,558, Cl. 526-142.000.
Tomizawa, Takashi: *See—*
Tsunekawa, Yuzo; and Tomizawa, Takashi, 4,524,596, Cl. 72-133.000.
Tomono, Makoto: *See—*
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,525,056, Cl. 355-3.0DD.
Tonniges, Heinz, to Deutsche Fibrit Gesellschaft Ebers & Dr. Muller mbH. Process for preparing flat articles based on defibrated components of wood. 4,525,321, Cl. 264-517.000.
Topline Automotive Engineering Inc.: *See—*
Miller, Thomas J., 4,524,734, Cl. 123-196.00S.
Toray Industries, Inc.: *See—*
Higuchi, Akira; and Okamoto, Miyoshi, 4,525,169, Cl. 8-485.000.
Yamane, Toshihiro; Ohashi, Kenzi; and Sakaguchi, Toshiharu, 4,525,297, Cl. 252-511.000.
Torii, Shunichi: *See—*
Omoda, Koichiro; Inagami, Yasuhiro; Torii, Shunichi; and Nagashima, Shigeo, 4,525,796, Cl. 364-730.000.
Toro Company, The: *See—*
Oberg, Gary R., 4,524,515, Cl. 30-276.000.
Torobin, Leonard B. Producing metal and metal glass microfilaments. 4,525,314, Cl. 264-9.000.
Tossounian, Jacques: *See—*
Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, 4,525,339, Cl. 424-16.000.
Toth, David M.: *See—*
Toth, Leo A.; and Toth, David M., 4,524,630, Cl. 74-110.000.
Toth, Leo A.; and Toth, David M. Mechanical force amplifier. 4,524,630, Cl. 74-110.000.
Tourtellier, Jean-Louis; and Schoen, Roger, to Etablissements Tourtellier S.A. Modular rail member for the translation of load-bearing carriages on an overhead track. 4,524,698, Cl. 104-107.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Imai, Fusao; and Okumura, Norio, 4,525,420, Cl. 428-372.000.
Toyo Contact Lens Co.: *See—*
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,525,563, Cl. 526-279.000.
Toyo Engineering Corporation: *See—*
Ohsaki, Kozo; Kikuchi, Katsutoshi; and Hirota, Yoshitsugu, 4,525,482, Cl. 518-707.000.
Toyo Jozo Company, Ltd.: *See—*
Imamura, Shigeyuki; Misaki, Hideo; and Muto, Naoki, 4,525,458, Cl. 435-196.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Kobayashi, Seishichi; Miyazawa, Tetsuo; and Ueno, Hiroshi, 4,525,497, Cl. 523-400.000.
Toyo Stauffer Chemical Co., Ltd.: *See—*
Takitani, Masaru; Tomiyasu, Shizuo; and Baba, Keikichi, 4,525,558, Cl. 526-142.000.
Toyoda, Kazuhiro; and Ono, Chikai, to Fujitsu Limited. Semiconductor memory device. 4,525,812, Cl. 365-155.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Nakamata, Hideo, 4,524,503, Cl. 29-407.000.
Okawa, Susumu; Matsui, Hideaki; Jufuku, Yasunobu; and Kato, Toshimi, 4,525,160, Cl. 474-242.000.
Tomita, Tsutomu; Horio, Kimihide; and Naganawa, Tadahisa, 4,525,151, Cl. 474-101.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Konomi, Toshiaki; and Ishiyama, Shinobu, 4,525,781, Cl. 364-431.010.
Toyu Food Co-Operative Corporation: *See—*
Hosaka, Yaoji, 4,525,373, Cl. 426-634.000.
Tractech, Inc.: *See—*
Neumann, Lawrence T.; and Dissett, Walter L., 4,524,640, Cl. 74-650.000.

Trammell, Earl M., Jr., to Bek-Tech Products Incorporated. Electronic fuse tester. 4,525,664, Cl. 324-51.000.
Transensory Devices, Inc.: *See—*
Petersen, Kurt E., 4,525,766, Cl. 361-283.000.
Traver, Frank J., to General Electric Company. Water based resin emulsions. 4,525,502, Cl. 524-96.000.
Treptau, Gerhard: *See—*
Hynek, Bernd; Valk, Giselher; and Treptau, Gerhard, 4,525,403, Cl. 428-87.000.
Tressler, Richard E.: *See—*
Kaiser, Gregory A.; DeMunda, Gabriel P.; and Tressler, Richard E., 4,525,429, Cl. 428-566.000.
Trickey, Peter W.; Netherway, David C.; and Clifford, William S., to Westland plc. Aircraft seat. 4,525,010, Cl. 297-216.000.
Triolo, Innocenzo: *See—*
Bonfiglioli, Silverio; and Triolo, Innocenzo, 4,524,742, Cl. 123-438.000.
Troutman, Richard C.: *See—*
McGregor, Walter; and Troutman, Richard C., 4,524,771, Cl. 128-339.000.
Troxler Electronic Laboratories, Inc.: *See—*
Molbert, John L.; and Riddle, Eddie R., 4,525,854, Cl. 378-089.000.
Trumpf GmbH & Co.: *See—*
Leibinger, Berthold, 4,524,661, Cl. 83-690.000.
TRW Ehrenreich GmbH & Co. KG: *See—*
Busch, Peter; and Barbet, Karl-Heinz, 4,524,943, Cl. 249-63.000.
TRW Inc.: *See—*
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,524,499, Cl. 29-156.80B.
Tsubakimoto Machinery & Engineering Co., Ltd.: *See—*
Matsushita, Yoshihiro, 4,524,861, Cl. 198-781.000.
Tsubouchi, Toshiyuki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Process for improving traction coefficient of traction drive fluid at high temperatures. 4,525,290, Cl. 252-73.000.
Tsuchiya, Chikara: *See—*
Sano, Yoshiaki; Tsuchiya, Chikara; and Maida, Osamu, 4,525,637, Cl. 307-350.000.
Tsuji, Sadahiko: *See—*
Fujibayashi, Kazuo; Sugiura, Muneharu; and Tsuji, Sadahiko, 4,525,036, Cl. 350-427.000.
Tsukamoto, Takashi; Sudo, Chuzo; Aihara, Kenji; and Nishimura, Syozi, to Sumitomo Metal Industries, Ltd. Steel wire for use in stranded steel core of an aluminum conductor, steel reinforced and production of same. 4,525,598, Cl. 174-128.00R.
Tsunekawa, Yuzo; and Tomizawa, Takashi, to Fuji Photo Film Co., Ltd. Method of forming and feeding torsion springs. 4,524,596, Cl. 72-133.000.
Tsunoda, Kikuo: *See—*
Ozaki, Kiyomi; and Tsunoda, Kikuo, 4,524,921, Cl. 242-84.10J.
Tsunoda, Yoshito: *See—*
Nakamura, Shigeru; Tsunoda, Yoshito; Shigematsu, Kazuo; Kaku, Toshimitsu; Maeda, Takeshi; and Kato, Tsuyoshi, 4,525,826, Cl. 369-46.000.
Tsuya, Noboru; and Arai, Kenichi, to Tsuya, Noboru. Method of manufacturing a thin ribbon wafer of semiconductor material. 4,525,223, Cl. 148-171.000.
Tung, Lu H.; Lo, Grace Y.; and Griggs, Jerald A., to Dow Chemical Company, The. Impact resistant α-methylstyrene-styrene copolymer blends. 4,525,532, Cl. 525-98.000.
Tung, William C. T.; and Deisz, George A., to Goodyear Tire & Rubber Company, The. Polyester composition. 4,525,524, Cl. 524-601.000.
Tunoda, Kikuo; and Ozaki, Kiyomi, to Ryobi Limited. Fishing spinning reels. 4,524,923, Cl. 242-84.50A.
Tuomaala, Jorma A. K., to Teratuote Oy. Elastic mounting for the rod-shaped tooth of a cut-off saw. 4,524,664, Cl. 83-840.000.
Turbo Kogyo Co., Ltd.: *See—*
Yamagishi, Takashi, 4,524,915, Cl. 241-39.000.
Turner, Roy D.: *See—*
Holman, Howard E.; and Turner, Roy D., 4,525,014, Cl. 339-14.00R.
Turner, S. Richard; Walker, Thad O.; Peiffer, Dennis G.; and Lundberg, Robert D., to Exxon Research and Engineering Co. Drilling fluids based on sulfonated thermoplastic polymers having improved low temperature rheological properties. 4,525,522, Cl. 524-547.000.
Tutsky, Ronald J. Skin care and shaving composition. 4,525,344, Cl. 424-73.000.
Tylan Corporation: *See—*
Drexel, Charles F.; and Blair, Richard F., 4,524,616, Cl. 73-203.000.
Tzabanakis, George, to Les Ateliers Mecaniques Alexandre, Inc. Tent bracket. 4,524,792, Cl. 135-90.000.
Tzvetkov, Krum K., to Centralen Savet na Nauchnotechnicheski Sayusi. Program automaton for weaving machines. 4,525,787, Cl. 364-470.000.
UCB Pharmaceuticals, Inc.: *See—*
Baltes, Eugene ; de Lannoy, Jean; and Rodriguez, Ludovic, 4,525,358, Cl. 514-255.000.
Uchida, Kazuo, to Diesel Kiki Co., Ltd. Adjusting device for adjusting initial injection lift of a double injection type fuel injection valve. 4,524,613, Cl. 73-119.00A.
Uchiyama, Yasuji: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; and Suzuki, Hideo, 4,524,668, Cl. 84-1.240.
Ueda Electronic Works Limited: *See—*
Kisioka, Kazuya; and Yamakoshi, Kenichi, 4,524,777, Cl. 128-677.000.
Ueda, Takashi; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Catalyst composition for polymerizing olefins. 4,525,469, Cl. 502-125.000.
Uemura, Toshirou: *See—*
Kino, Jirou; and Uemura, Toshirou, 4,525,774, Cl. 363-17.000.
Ueno, Hiroshi: *See—*
Kobayashi, Seishichi; Miyazawa, Tetsuo; and Ueno, Hiroshi, 4,525,497, Cl. 523-400.000.
ULO-Werk Moritz Ullmann GmbH & Co. KG: *See—*
Class, Eberhard; Schweizer, Heiner; and Frank, Gunther, 4,524,843, Cl. 180-179.000.
Ulrich, Jean: *See—*
Laisney, Bernard; Letoffe, Michel; Perrin, Patrice; and Ulrich, Jean, 4,525,565, Cl. 528-17.000.
Umezawa, Hamao; Takeuchi, Tomio; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. (−)-15-Deoxyspergualin, process for the preparation thereof, and intermediate of the same. 4,525,299, Cl. 260-112.50R.
Umezawa, Hamao: *See—*
Someno, Tetsuya; Kato, Kazuo; Saino, Tetsushi; Ishii, Shinichi; Takeuchi, Tomio; and Umezawa, Hamao, 4,525,465, Cl. 502-7.000.
UniCharm Corporation: *See—*
Suzuki, Migaku; Ochi, Mitsuzo; and Nozaki, Satoshi, 4,525,229, Cl. 156-161.000.
Union Carbide Corporation: *See—*
Atkins, Kenneth E.; and Gentry, Robert R ., 4,525,498, Cl. 523-511.000.
Bushey, Dean F.; and D'Silva, Themistocles D. J., 4,525,357, Cl. 514-258.000.
Chiu, Herman S., 4,525,397, Cl. 428-36.000.
Kurtz, Stuart J.; and Potts, James E., 4,525,257, Cl. 204-159.200.
Snyder, William J.; Miller, Raymond H.; and Kobayashi, Hisashi, 4,525,138, Cl. 431-187.000.
Union Oil Company Of California: *See—*
Croudace, Michael C., 4,525,174, Cl. 44-68.000.
Union Underwear Company, Inc.: *See—*
Bell, James D., 4,524,706, Cl. 112-121.290.
Uniroyal, Inc.: *See—*
Ahnemiller, James; and Peascoe, Warren J., 4,525,487, Cl. 521-78.000.
United Kingdom Atomic Energy Authority: *See—*
Bowen, Dennis H., 4,525,228, Cl. 156-155.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Hilsum, Cyril, 4,525,032, Cl. 350-331.00R.
U.S. Floor Systems, Inc.: *See—*
Williams, Robert C., III; and Williams, Stephen R., 4,524,477, Cl. 15-50.00R.
United States of America
Army: *See—*
Durenec, Peter; and Lowe, Clifford E., 4,524,675, Cl. 89-41.030.
Gilvydis, Jaunutis B., 4,524,674, Cl. 89-36.00H.
Commerce: *See—*
Hernandez, Gonzalo J., 4,525,067, Cl. 356-346.000.
Energy: *See—*
Ayers, William J., Jr.; Carter, Charles R.; Griffith, Richard A.; Loomis, Richard B.; and Notestein, John E., 4,524,796, Cl. 137-240.000.
Bangerter, Roger O.; and Meeker, Donald J., 4,525,323, Cl. 376-106.000.
McGuire, Raymond R.; Coon, Clifford L.; Harrar, Jackson E.; and Pearson, Richard K., 4,525,252, Cl. 204-101.000.
Smith, Douglas D., 4,525,080, Cl. 374-115.000.
Navy: *See—*
Corzine, Robert G.; and Mosko, Joseph A., 4,525,720, Cl. 343-895.000.
Diels, Jean-Claude, 4,525,843, Cl. 372-94.000.
Phillips, Raymond J., 4,525,013, Cl. 339-7.000.
U.S. Philips Corporation: *See—*
Admiraal, Daniel J. H.; and Lopes Cardozo, Benjamin, 4,525,856, Cl. 381-93.000.
Da Silva, Artur F., 4,525,623, Cl. 219-373.000.
De Bijl, Adrianus M. J.; and Melai, Henri A. I., 4,525,648, Cl. 315-224.000.
De Ronde, Frans C., 4,525,690, Cl. 333-116.000.
Dimigen, Heinz; and Hubsch, Hubertus, 4,525,417, Cl. 428-244.000.
Hubner, Horst; Lydtin, Hans; Rehder, Ludwig; and Zaengel, Thomas, 4,525,379, Cl. 427-53.100.
Kupfer, Karl H., 4,525,681, Cl. 330-286.000.
Rouws, Petrus L. A., 4,524,933, Cl. 248-27.300.
Sieben, Joannes H. F. C., 4,524,927, Cl. 242-198.000.
Smith, James, 4,525,653, Cl. 315-366.000.
United States Steel Corporation: *See—*
Pringle, William L., 4,524,501, Cl. 29-237.000.
United Technologies Corporation: *See—*
Lillibridge, Herbert J.; and Schwarzmann, Russell A., 4,524,980, Cl. 277-199.000.
Perretta, Frederick A., 4,525,770, Cl. 361-399.000.
Univention Incorporated: *See—*
Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,524,534, Cl. 42-1.00S.
Universitat Stuttgart, Institut Fur Flugnavigation: *See—*
Wildermuth, Eberhard; Jansen, Dirk; Burkhardt, Rudolf; and Merz, Joachim, 4,525,717, Cl. 343-452.000.

University of Hawaii: *See*—
Birch, Robert G.; and Patil, Suresh S., 4,525,354, Cl. 424-115.000.
University of Miami: *See*—
Fletcher, Mary A., 4,525,459, Cl. 436-544.000.
University of Minnesota, Regents of the: *See*—
Zito, Santo W.; and Staba, E. John, 4,525,455, Cl. 435-135.000.
University of Toronto Innovations Foundation, The: *See*—
Wong, Stephen L.; and Salama, Clement A. T., 4,525,679, Cl. 330-277.000.
Unowsky, Joel: *See*—
Behl, Charanjit; Beskid, George; Shah, Navnit; Tossounian, Jacques; and Unowsky, Joel, 4,525,339, Cl. 424-16.000.
UOP Inc.: *See*—
Rohrbach, Ronald P., 4,525,456, Cl. 435-176.000.
Upjohn Company, The: *See*—
Aristoff, Paul A., 4,525,586, Cl. 544-174.000.
Urbach, Hansjorg: *See*—
Henning, Rainer; and Urbach, Hansjorg, 4,525,301, Cl. 260-112.50R.
Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Parenteral controlled delivery. 4,525,162, Cl. 604-56.000.
USG Corporation: *See*—
Rehder, Thomas E.; and Williams, Terrance L., 4,525,388, Cl. 427-221.000.
Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; and Mimura, Yoshiki, 4,525,380, Cl. 427-53.100.
Sugioka, Shinji, 4,525,382, Cl. 427-54.100.
Tanaka, Kazuya; and Sugioka, Shinji, 4,525,381, Cl. 427-54.100.
USM Corporation: *See*—
Carlson, John H., 4,524,639, Cl. 74-640.000.
Uytterhoeven, Herman J.; Gilliams, Yvan K.; De Winter, Walter F.; Marien, August M.; and De Volder, Noel J., to Agfa-Gevaert, N.V. Liquid developer for development of electrostatic images comprising onium salt polymer and an anion. 4,525,446, Cl. 430-117.000.
Vaillancourt, Vincent L., to Manresa, Inc. Closed system catheter with guide wire. 4,525,157, Cl. 604-52.000.
Vaillancourt, Vincent L., to Manresa, Inc. Treating hydrophobic filters to render them hydrophilic. 4,525,374, Cl. 427-2.000.
Val Products, Inc.: *See*—
Steudler, Frederick W., Jr., 4,524,724, Cl. 119-72.500.
Valayil, Silvester P.; and Aronson, Vita, to Shipley Company Inc. Aluminum storage disc. 4,525,759, Cl. 360-135.000.
Valentino, Pearl T. Hospital bed step. 4,524,475, Cl. 5-507.000.
Valeo: *See*—
Filderman, Rene ; and Pilache, Michel, 4,525,159, Cl. 474-201.000.
Renaud, Pierre, 4,524,856, Cl. 192-98.000.
Valk, Giselher: *See*—
Hynek, Bernd; Valk, Giselher; and Treptau, Gerhard, 4,525,403, Cl. 428-87.000.
Valmet Oy: *See*—
Laapotti, Jorma, 4,525,241, Cl. 162-301.000.
Van Dorn Company: *See*—
Fundom, Danny L.; and Kirk, William A., 4,524,879, Cl. 220-273.000.
Vance, Ian A. W.; and Bainton, Stephen D., to International Standard Electric Corporation. Duplex radio system utilizing time compression expansion. 4,525,835, Cl. 370-29.000.
van den Bogert, Andries J. E. Apparatus for dissecting slaughtered animals. 4,524,488, Cl. 17-11.000.
van den Wildenberg, Adrianus M. M.; and Smeets, Andreas L. M. T., to Vialle B.V. Evaporating-pressure regulating device. 4,524,747, Cl. 123-557.000.
VanDeripe, Donald R. Golf shoes. 4,524,531, Cl. 36-127.000.
Van Ee, Gary R.: *See*—
Wilde, Bernard D.; Van Ee, Gary R.; Ledebuhr, Richard L.; and Rotz, C. Alan, 4,524,572, Cl. 56-327.00R.
Van Hee, Michel A. J., to Atlas Copco Aktiebolag. Gear box for a compressor plant. 4,524,638, Cl. 74-606.00R.
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., to Compagnie Neerlandaise de l'Azote. Process for the production of urea granules. 4,525,198, Cl. 71-28.000.
VanLenten, James A.: *See*—
Plowman, Richard E.; and VanLenten, James A., 4,524,816, Cl. 164-287.000.
Van Loveren, Augustinus G.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,525,364, Cl. 426-3.000.
Vanmarcke, Luc A.: *See*—
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., 4,525,198, Cl. 71-28.000.
van Mil, Martinus P. G., to Stork PMT B.V. Device for separating and processing the gizzards of slaughtered poultry. 4,524,489, Cl. 17-11.000.
Van Olst, Gijsbrecht H. J.: *See*—
Ericson, Kurt S. B.; and Van Olst, Gijsbrecht H. J., 4,524,795, Cl. 137-216.200.
Van Overloop, Ronald R., to Kendall Company, The. Scrub sponge with opposed puncture member arms. 4,525,091, Cl. 401-134.000.
Varian Associates, Inc.: *See*—
Berkowitz, Edward H., 4,525,673, Cl. 324-312.000.
Vasconcellos, Stephen R.; Yaghmaie, Farrokh; and Howe, Paul E., to Texaco Inc. Process for separating a water dispersion of ash, slag and char particulate matter. 4,525,280, Cl. 210-728.000.
Vasnev, Anatoly N.: *See*—
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.
Vath, F. Leo, to Standard Register Company, The. One-piece two-way mailer unit. 4,524,903, Cl. 229-73.000.
Veltkamp, John H.: *See*—
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., 4,524,941, Cl. 248-544.000.
Ventures Research & Development Group: *See*—
Korman, Nathaniel I., 4,525,736, Cl. 358-28.000.
Vepa Aktiengesellschaft: *See*—
Fleissner, Heinz, 4,524,589, Cl. 68-5.00D.
Verdi, Guido, to BAMA, SpA. Device for the insertion of small blocking strips or ribbons for multiple sheet material. 4,525,236, Cl. 156-517.000.
Verex Laboratories, Inc.: *See*—
Dunn, James M.; and Haas, Ronald T., 4,525,345, Cl. 424-22.000.
Vermeulen, Johannes C.: *See*—
Cruz, Claude A.; and Vermeulen, Johannes C., 4,525,641, Cl. 307-465.000.
Verrando, Marcel G., III: *See*—
Cordes, Harry D.; Haberer, Thomas G.; and Verrando, Marcel G., III, 4,525,183, Cl. 55-179.000.
Vetelino, John F.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,525,643, Cl. 310-313.00A.
Vettiger, Peter: *See*—
Beha, Johannes G.; Jaeckel, Heinz; and Vettiger, Peter, 4,525,730, Cl. 357-5.000.
Viale, Giorgio: *See*—
Magnasco, Enrico; and Viale, Giorgio, 4,524,801, Cl. 137-567.000.
Vialle B.V.: *See*—
van den Wildenberg, Adrianus M. M.; and Smeets, Andreas L. M. T., 4,524,747, Cl. 123-557.000.
Vickers p.l.c.: *See*—
Jamieson, John R., 4,524,875, Cl. 212-239.000.
Vidalin, Jacques; and Aucouturier, Jean L., to L'Universite de Bordeaux 1. Method for controlling the comparison to be effected between reference logical entities and logical entities issuing from a file. 4,525,803, Cl. 364-900.000.
Vitas, John K.; and Reed, Harry J., to Plasti-fab, Inc. Open channel gate valve. 4,524,950, Cl. 251-326.000.
Vitek, Edward J., Jr.: *See*—
Field, Thomas R.; Hughes, Frank M.; Shakib, Iraj D.; and Vitek, Edward J., Jr., 4,525,086, Cl. 400-144.200.
Vitek, Jaromir: *See*—
Landa, Vaclav; and Vitek, Jaromir, 4,525,248, Cl. 204-29.000.
Vivarelli, Franco. Fishing reel with oscillating movement actuating lever. 4,524,922, Cl. 242-84.10R.
Vlasak, Thomas, to BBC Brown, Boveri & Cie. Method for the doping of supporting silicon plates for the manufacture of semiconductors. 4,525,224, Cl. 148-189.000.
Vock, Manfred H.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,525,364, Cl. 426-3.000.
Voest-Alpine Aktiengesellschaft: *See*—
Pochmarski, Luzian; Koller, Otto; and Abendstein, Karl, 4,525,211, Cl. 75-58.000.
Vogelgesang, Peter J., to Minnesota Mining & Manufacturing Company. Driver for rotating a magnetic playback head. 4,525,696, Cl. 335-272.000.
Vollstedt, Gerald: *See*—
Bartsch, Erich O.; and Vollstedt, Gerald, 4,525,282, Cl. 210-747.000.
Vondran, Gary L. Concrete permeability testing device and method. 4,524,604, Cl. 73-38.000.
von Hofen, Edward L. Universal platform chain. 4,524,865, Cl. 198-852.000.
Voplex Corporation: *See*—
Wnuk, Jack G., 4,525,231, Cl. 156-185.000.
Vosbikian, John: *See*—
Strahs, Martin P.; and Vosbikian, John, 4,524,938, Cl. 248-110.000.
W. Haking Enterprises, Limited: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,525,048, Cl. 354-173.100.
Wong, Wan C.; and Oshima, Shigeru, 4,525,051, Cl. 354-203.000.
W. Schlafhorst & Co.: *See*—
Raasch, Hans; and Lassmann, Manfred, 4,524,578, Cl. 57-263.000.
WABCO Fahrzeugbremsen GmbH: *See*—
Reinecke, Erich; and Isernhagen, Fritz, 4,524,850, Cl. 188-71.800.
Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe m.b.H.: *See*—
Griesshammer, Rudolf; and Peterat, Michael, 4,525,336, Cl. 423-348.000.
Waggoner, Wayne. Auxiliary axle apparatus. 4,524,841, Cl. 280-81.00A.
Wagner, Gary L.; and Serrone, Michael J., to Ford Aerospace & Communications Corporation. N×m stripline switch. 4,525,689, Cl. 333-104.000.
Wagner, Paul-Heinz: *See*—
Dubiel, Oswald; Hirtsiefer, Karl-Richard; and Wagner, Paul-Heinz, 4,524,651, Cl. 81-57.390.
Wakabayashi, Hiroshi: *See*—
Ogawa, Harumi; Obikawa, Fumito; Koyama, Toshio; Otsubo, Yoshiaki; Wakabayashi, Hiroshi; and Otani, Tadashi, 4,525,049, Cl. 354-173.110.

Waldron, John W.: *See*—
Hayes, Daniel F.; Sias, Robert G.; Chesney, Lloyd; and Waldron, John W., 4,525,253, Cl. 204-149.000.

Waldron, Joseph P.; and Brown, Ivan R., to Hardinge Brothers, Inc. Indexable machine tool turret and attachments therefor. 4,524,655, Cl. 82-36.00A.

Walker, David E. Two stage electric drive. 4,525,655, Cl. 318-45.000.

Walker Machine and Foundry Company: *See*—
Colman, Joseph C., 4,525,113, Cl. 410-41.000.

Walker-Taylor, Sherry. Book assembly. 4,524,993, Cl. 281-46.000.

Walker, Thad O.: *See*—
Turner, S. Richard; Walker, Thad O.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,525,522, Cl. 524-547.000.

Wallach, Steven J.: *See*—
Bratt, Richard G.; Clancy, Gerald F.; Gavrin, Edward S.; Gruner, Ronald H.; Mundie, Craig J.; Schleimer, Stephen I.; and Wallach, Steven J., 4,525,780, Cl. 364-200.000.

Wallich, Manfred: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; and Wallich, Manfred, 4,525,318, Cl. 264-259.000.

Wallow, Peter: *See*—
Bisping, Bernhard; Gersbach, Klaus; Luther, Hans; Simon, Walter; Wallow, Peter; Montier, Patrick; Moreau, Pierre A.; and Sauvestre, Jean C., 4,524,695, Cl. 102-430.000.

Walus, Aloysius N.: *See*—
DenHartog, Herman C.; and Walus, Aloysius N., 4,525,521, Cl. 524-517.000.

Wang, Faa-Ching, to Hewlett-Packard Company. Extrinsic gettering of GaAs wafers for MESFETS and integrated circuits. 4,525,239, Cl. 156-645.000.

Wani, Hasashi: *See*—
Imazeki, Kazuyoshi; and Wani, Hasashi, 4,525,738, Cl. 358-181.000.

Ward, Douglas K., to Powerflow, Inc. Splash guard. 4,524,986, Cl. 280-154.50R.

Ward, Ian M.: *See*—
Capaccio, Giancarlo; and Ward, Ian M., 4,525,564, Cl. 526-348.100.

Warkentin, Henry, to Agriculture Service Corporation. Combine attachment for harvesting radish seeds and the like. 4,524,780, Cl. 130-30.00G.

Warner-Lambert Company: *See*—
Butler, Donald E.; Hershenson, Fred M.; and Pavia, Michael R., 4,525,476, Cl. 514-326.000.

Warzelhan, Volker; and Ball, Wolfgang, to BASF Aktiengesellschaft. Preparation of homopolymers and copolymers of α-monoolefins using a ziegler catalyst system. 4,525,550, Cl. 526-116.000.

Washington Research Foundation: *See*—
Weinstein, Boris; and Orton, Edward, 4,525,540, Cl. 525-327.200.

Washington State University Research Foundation, Inc.: *See*—
Matteson, Donald S.; and Sadhu, Kizhakethil M., 4,525,309, Cl. 260-462.00C.

Watanabe, Fumihiko: *See*—
Narisada, Masayuki; Watanabe, Fumihiko; Okada, Tetsuo; and Matsumura, Hiromu, 4,525,355, Cl. 514-210.000.

Watanabe, Hiroshi: *See*—
Kage, Kouzou; and Watanabe, Hiroshi, 4,525,868, Cl. 455-206.000.

Watanabe, Kazuhiro: *See*—
Kato, Yukiteru; and Watanabe, Kazuhiro, 4,525,365, Cl. 426-101.000.

Watanabe, Masazumi: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,525,361, Cl. 514-689.000.

Watanabe, Michihiro: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, 4,525,303, Cl. 260-239.55R.

Watanabe, Motokazu: *See*—
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,525,548, Cl. 526-72.000.

Watanabe, Noboru: *See*—
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,525,536, Cl. 525-194.000.

Watanabe, Nobuhiko; and Tanaka, Masato, to Sony Corporation. Apparatus for recording and reproducing a digital signal. 4,525,752, Cl. 360-13.000.

Watanabe, Shoji; and Okitsu, Kiyoshi, to Daicel Chemical Industries, Ltd. Radiation-curable resin composition. 4,525,258, Cl. 204-159.230.

Watson, Philip: *See*—
Watson, Thomas A.; and Watson, Philip, 4,525,124, Cl. 416-132.00B.

Watson, Thomas A.; and Watson, Philip. Balanced stress vertical axis wind turbine. 4,525,12′, Cl. 416-132.00B.

Watson, W. Keith R. Well pipe perforation detector. 4,525,815, Cl. 367-35.000.

Weber S.p.A.: *See*—
Bonfiglioli, Silverio; and Triolo, Innocenzo, 4,524,742, Cl. 123-438.000.

Webster, Marvin K.; Flynn, Richard T.; Porter, Marion G.; and Seminsky, George M., to Honeywell Information Systems Inc. Split-cycle cache system with SCU controlled cache clearing during cache store access period. 4,525,777, Cl. 364-200.000.

Wegner, Paul C., to Tiegel Manufacturing Co. Enveloping a battery plate by a dip process and product produced thereby. 4,524,509, Cl. 29-623.500.

Wehrmann, Claus, to Lenze GmbH & Co. KG Aerzen. Multiple bolt turning machine. 4,524,919, Cl. 242-67.10R.

Wei, Chung H., to General Electric Company. Homogenizer process for forming emulsion/suspension polymers. 4,525,545, Cl. 526-65.000.

Weinstein, Boris; and Orton, Edward, to Washington Research Foundation. Cyclic ester dienes, polymeric and other derivatives thereof. 4,525,540, Cl. 525-327.200.

Weinstock, Leonard M.: *See*—
Amato, Joseph S.; Karady, Sandor; and Weinstock, Leonard M., 4,525,582, Cl. 534-558.000.

Weishaupt, Walter: *See*—
Bourauel, Fritz; Flohr, Wolfgang P.; and Weishaupt, Walter, 4,524,612, Cl. 73-117.300.

Weisman, Morey. Technique for property enhancement of open-cell foam material. 4,525,386, Cl. 427-185.000.

Weiss, Ervin; Rosenberg, Melvin; and Judas, Herbert. Dental and oral preparation. 4,525,342, Cl. 424-49.000.

Weldtec, Inc.: *See*—
Green, Jasper L.; and Hackett, Steven B., 4,525,096, Cl. 403-49.000.

Welker Engineering Company: *See*—
Welker, Robert H., 4,525,127, Cl. 417-479.000.

Welker, Robert H., to Welker Engineering Company. Fluid pump mechanism. 4,525,127, Cl. 417-479.000.

Welzenbach, Manfred: *See*—
Schenkel, Klaus D.; and Welzenbach, Manfred, 4,525,834, Cl. 370-3.000.

Wendling, Peter: *See*—
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; Pampus, Gottfried; and Hohmann, Gerhard, 4,525,561, Cl. 526-220.000.

Wenzel, Kenneth G.; and Duke, Jerry R., to Thorsen Tool Company. Ratchet wrench of the socket drive type with socket ejector. 4,524,652, Cl. 81-63.000.

Werner, Hugo: *See*—
Kuxdorf, Bernhard; Luhr, Peter; Werner, Hugo; Thummler, Ursus; and Dorn, Friedrich-Wilhelm, 4,525,329, Cl. 422-202.000.

Wertheim, Max M.; and Herbermann, Richard J., to Grumman Aerospace Corporation. Wind turbine maximum power tracking device. 4,525,633, Cl. 290-44.000.

Wessling, Ritchie A.; and Pickelman, Dale M., to Dow Chemical Company, The. Surface active polymeric surfactants containing side chain hydrophobes. 4,525,526, Cl. 524-815.000.

West, Robert F., to Stanley Works, The. Utility knife. 4,524,518, Cl. 30-330.000.

Western Design Corporation: *See*—
Golden, Michael D., 4,524,673, Cl. 89-33.020.

Westinghouse Electric Corp.: *See*—
Humphries, Benjamin T.; and Spisak, Andrew J., 4,525,642, Cl. 310-260.000.
Lamb, Miles P.; and Karol, Herman S., 4,525,095, Cl. 403-16.000.
Rowe, Neal E., 4,524,598, Cl. 72-198.000.

Westland plc: *See*—
Trickey, Peter W.; Netherway, David C.; and Clifford, William S., 4,525,010, Cl. 297-216.000.

Wetterlin, Kjell I. L., to Aktiebolaget Draco. Dosage inhalator. 4,524,769, Cl. 128-203.150.

Wever, Ruben; Allred, Lorin D.; and Ruiz, Marco A., to Wiltron Company. System for accessing electrical circuits and relay switch thereof. 4,525,605, Cl. 179-175.20R.

Wheeler, Jennifer M., to Standard Telephones and Cables, PLC. Ceramic capacitors and dielectric compositions. 4,525,768, Cl. 361-321.000.

Whelen Engineering Co., Inc.: *See*—
Lyons, Harold W., 4,524,679, Cl. 98-40.020.

Whitby, Ronney J. Loudspeaker system. 4,524,846, Cl. 181-152.000.

White Mop Wringer Company: *See*—
Wright, Paul O., 4,524,479, Cl. 15-147.00R.

White, Robert W.: *See*—
Formo, Jerome L.; Lasher, Albert C.; and White, Robert W., 4,524,512, Cl. 30-147.000.

White, Roy: *See*—
D'Amelia, Ronald P.; Stroz, John J.; and White, Roy, 4,525,363, Cl. 426-3.000.

Wiechard, Charles A., to AT&T Technologies, Inc. Molded plastic article having metallic inserts. 4,524,516, Cl. 30-290.000.

Wiegers, Wilhelmus J.; Fenn, Ronald S.; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Alkanoic acid ésters of 3,4,5,6,6-pentamethyl heptanol-2 and alkyl homologues thereof; process for preparing same and organoleptic uses thereof. 4,524,783, Cl. 131-276.000.

Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with a macrocyclic carbonate. 4,525,364, Cl. 426-3.000.

Wieland-Werke AG: *See*—
Hage, Manfred; and Junker, Otto, 4,524,822, Cl. 165-141.000.

Wiener, Robert P.: *See*—
Louis, Arnold S.; and Wiener, Robert P., 4,525,698, Cl. 338-39.000.

Wilde, Bernard D.; Van Ee, Gary R.; Ledebuhr, Richard L.; and Rotz, C. Alan. Pickle harvester. 4,524,572, Cl. 56-327.00R.

Wildermuth, Eberhard; Jansen, Dirk; Burkhardt, Rudolf; and Merz, Joachim, to Universitat Stuttgart, Institut Fur Flugnavigation. Position display instrument. 4,525,717, Cl. 343-452.000.

Wilke, Rudolf. Method for attaching an article to a wall. 4,524,506, Cl. 29-453.000.

Willcocks, Martin E. G., to Bogue, John C.; and Ruggles, Wesley, Jr. Variable rate and variable limit dimension controls for a directional enhancement system. 4,525,855, Cl. 381-22.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Thread changing mechanism for sewing machines. 4,524,703, Cl. 112-098.000.
Williams, Charles R., to Otis Engineering Corporation. Landing nipple with subsurface safety valve. 4,524,830, Cl. 166-321.000.
Williams, Harry K.: *See—*
Hill, Frank P., Jr.; Alden, John W., Jr.; and Williams, Harry K., 4,524,729, Cl. 122-498.000.
Williams, John E., Jr., to AAKAC Industries Inc. Anti-dive front wheel suspension suitable for motorcycle. 4,524,844, Cl. 180-219.000.
Williams Patent Crusher and Pulverizer Company: *See—*
Williams, Robert M., 4,524,917, Cl. 241-101.200.
Williams, Robert A. Locking apparatus for test probe. 4,525,016, Cl. 339-75.00R.
Williams, Robert A. Electrical cable connector assembly. 4,525,021, Cl. 339-104.000.
Williams, Robert C., III; and Williams, Stephen R., to U.S. Floor Systems, Inc. Cleaning solution dispenser attachment for rotary floor cleaning machine. 4,524,477, Cl. 15-50.00R.
Williams, Robert E., Jr.: *See—*
Campbell, John R.; and Williams, Robert E., Jr., 4,525,567, Cl. 528-27.000.
Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Air seal and lubrication system for roller grinding mills. 4,524,917, Cl. 241-101.200.
Williams, Rulon A. Machine for molding and curing a mass of resilient material. 4,525,132, Cl. 425-117.000.
Williams, Stephen R.: *See—*
Williams, Robert C., III; and Williams, Stephen R., 4,524,477, Cl. 15-50.00R.
Williams, Terrance L.: *See—*
Rehder, Thomas E.; and Williams, Terrance L., 4,525,388, Cl. 427-221.000.
Williamson, Richard C.: *See—*
Foyt, Arthur G.; Leonberger, Frederick J.; and Williamson, Richard C., 4,525,871, Cl. 455-325.000.
Willus, Charles A.; Kosonen, Vaino J.; and Sanchez, Dale R., to Dorr-Oliver Incorporated. Filtrate discharge system for pressure filter. 4,525,274, Cl. 210-232.000.
Wilmarth, Charles R. Wire puzzle. 4,524,972, Cl. 273-158.000.
Wilson, David H.; and Loe, James M., to K-Tron International, Inc. Apparatus and method for improving the accuracy of a loss-in-weight feeding system. 4,524,886, Cl. 222-58.000.
Wilson, John B.: *See—*
Pan, Jing-Jong; and Wilson, John B., 4,525,680, Cl. 330-277.000.
Wilson, Leslie B., to Dayco Corporation. Belt tensioner and method of making the same. 4,525,153, Cl. 474-138.000.
Wilson, Richard L., to American Standard Inc. Vigilance safety control system. 4,525,011, Cl. 303-19.000.
Wiltron Company: *See—*
Wever, Ruben; Allred, Lorin D.; and Ruiz, Marco A., 4,525,605, Cl. 179-175.20R.
Wimmer, Warren K.: *See—*
Murphy, Desmond L.; and Wimmer, Warren K., 4,525,688, Cl. 333-81.00R.
Winter, Joseph: *See—*
Gullotti, Damian V.; Winter, Joseph; Young, Kenneth P.; and Evans, Robert D., 4,524,820, Cl. 164-476.000.
Winterbottom, Martin E.: *See—*
Ashman, Glynn; Winterbottom, Martin E.; and Berry, Kelvin T., 4,524,677, Cl. 92-168.000.
Withers, Stanley J.; Schneiderman, Gary E.; and Little, William M., Jr. Split carrier for eyelid sensor and the like. 4,524,776, Cl. 128-644.000.
Wittmer, Paul: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,525,484, Cl. 521-56.000.
Wizner, Mark A.: *See—*
Sachdev, Krishna G.; Sachdev, Harbans S.; Aviram, Ari; and Wizner, Mark A., 4,525,722, Cl. 346-1.100.
Wnuk, Jack G., to Voplex Corporation. Method of making cushioned automotive strap handle. 4,525,231, Cl. 156-185.000.
Woditsch, Peter; Abels, Martin; and Brazel, Berthold, to Bayer Aktiengesellschaft. Process for the production of silicon. 4,525,334, Cl. 423-324.000.
Wohlfarth, Dieter; and Kostelezky, Walter, to Daimler-Benz Aktiengesellschaft. Process for determining maintenance and serving intervals on motor vehicles. 4,525,782, Cl. 364-431.010.
Wold, Aaron: *See—*
Soled, Stuart L.; Wold, Aaron; and Kershaw, Robert, 4,525,206, Cl. 75-0.5BA.
Wolf, Daniel. Infra-red heating apparatus. 4,524,753, Cl. 126-99.00R.
Wolf, Gerhard, to Siemens Aktiengesellschaft. Data transmission facility between two asynchronously controlled data processing systems with a buffer memory. 4,525,849, Cl. 375-118.000.
Wolf, Hans-Peter: *See—*
Dinklage, Horst; Fink, Herbert; and Wolf, Hans-Peter, 4,525,418, Cl. 428-264.000.
Wolf, Henry W.: *See—*
Rios, Victor; and Wolf, Henry W., 4,524,486, Cl. 16-381.000.
Wolfe, John R., III: *See—*
Frank, Jimmy I.; and Wolfe, John R., III, 4,524,524, Cl. 33-147.00M.
Wong, Backman, to Standard-Thomson Corporation. Automotive thermostatic fluid control valve device. 4,524,907, Cl. 236-34.500.
Wong, Stephen L.; and Salama, Clement A. T., to University of Toronto Innovations Foundation, The. High gain amplifying stage by output conductance cancellation. 4,525,679, Cl. 330-277.000.
Wong, Wan C.; and Oshima, Shigeru, to W. Haking Enterprises, Limited. Automatic slot positioning device for camera take-up spool. 4,525,048, Cl. 354-173.100.
Wong, Wan C.; and Oshima, Shigeru, to W. Haking Enterprises, Limited. Still camera with pressure plate control device. 4,525,051, Cl. 354-203.000.
Woo, Edmund P.; and Mullins, Michael J., to Dow Chemical Company, The. Polymers of 3,3-disubstituted-furandione compounds. 4,525,577, Cl. 528-327.000.
Wood, Denis; Thomas, John F., Jr.; Dipper, Barry; Stegenga, Philip D.; Veltkamp, John H.; Katsma, William L.; and Norton, Robert L., to Donnelly Corporation. Rearview mirror support bracket. 4,524,941, Cl. 248-544.000.
Wood, Robert F., Jr.; Monahan, John F.; and Levine, Peter A., to RCA Corporation. Dark current measurement and control for cameras having field-transfer CCD imagers. 4,525,743, Cl. 358-213.000.
Wood, Thomas H.: *See—*
Chemla, Daniel S.; Damen, Theodoor C.; Gossard, Arthur C.; Miller, David A. B.; and Wood, Thomas H., 4,525,687, Cl. 332-7.510.
Woodall, James C., to Mark Products Incorporated. Leakage testing cable connector network. 4,525,814, Cl. 367-20.000.
Woodall, Jerry M.: *See—*
Chappell, Terry I.; Jackson, Thomas N.; and Woodall, Jerry M., 4,525,731, Cl. 357-12.000.
Woods, John: *See—*
Rooney, John M.; Woods, John; and Conway, Paul, 4,525,232, Cl. 156-273.300.
Woodward, Donald W.; Katsaros, Arthur T.; and Rowles, Howard C., to Air Products and Chemicals, Inc. Dual dephlegmator process to separate and purify syngas mixtures. 4,525,187, Cl. 62-31.000.
Wright, Dale M.; and Kiraly, Robert L., to Hughes Helicopters, Inc. In-flight monitoring of composite structural components such as helicopter rotor blades. 4,524,620, Cl. 73-587.000.
Wright, John T.: *See—*
Doell, Brant; and Wright, John T., 4,524,730, Cl. 123-27.0GE.
Wright, Paul O., to White Mop Wringer Company. Replaceable plastic mophead. 4,524,479, Cl. 15-147.00R.
Wu, Chung P., to RCA Corporation. Alloying of aluminum metallization. 4,525,221, Cl. 148-1.500.
Wu, Mu-Yen M.; and Ball, Lawrence E., to Standard Oil Company, The. Process for the preparation of polyesteramide from cyclic lactone. 4,525,578, Cl. 528-354.000.
Wu, Philip T.: *See—*
Cochran, William H.; and Wu, Philip T., 4,525,810, Cl. 365-102.000.
Wulff, Lee. Fly line. 4,524,540, Cl. 43-44.980.
Wurmli, Arthur, to Rieter Machine Works Ltd. Device for donning bobbins onto a transport band. 4,524,579, Cl. 57-276.000.
Wyland, Alvin D., to Amana Refrigeration, Inc. Method for microwave defrosting. 4,525,615, Cl. 219-10.55M.
Xerox Corporation: *See—*
Crean, Peter A., 4,525,721, Cl. 346-1.100.
Law, Kock-Yee; and Bailey, Frank C., 4,525,592, Cl. 564-307.000.
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; Tomiyama, Shunsuke; and Saitoh, Koichi, 4,525,723, Cl. 346-74.400.
Yabe, Hisao: *See—*
Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,525,220, Cl. 134-21.000.
Yablonovitch, Eli, to Exxon Research and Engineering Co. Inverted, optically enhanced solar cell. 4,525,593, Cl. 136-255.000.
Yachigo, Shinichi; Ishii, Tamaki; Takahashi, Yukoh; and Terada, Yutaka, to Sumitomo Chemical Co., Ltd. Stabilizer for polymeric substance and polymeric substance composition containing the same. 4,525,514, Cl. 524-291.000.
Yaghmaie, Farrokh: *See—*
Vasconcellos, Stephen R.; Yaghmaie, Farrokh; and Howe, Paul E., 4,525,280, Cl. 210-728.000.
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, to Yuwa Sangyo KK. Method and apparatus for making a cylindrical package for steel strip coil. 4,524,562, Cl. 53-409.000.
Yahav, Shimon: *See—*
Daar, Yair; and Yahav, Shimon, 4,524,772, Cl. 128-355.000.
Yajima, Mizuo, to Asama Chemical Co., Ltd. Method for prevention of oxidation of oils and fats and soft capsules containing the treated oils and fats. 4,525,306, Cl. 260-428.500.
Yakima, Inc.: *See—*
Cole, Stephen J., 4,524,893, Cl. 224-319.000.
Yamada, Keizo: *See—*
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, 4,525,209, Cl. 75-51.500.
Yamada, Takao: *See—*
Matsumoto, Akio; and Yamada, Takao, 4,525,609, Cl. 200-38.00R.
Yamada, Yasuo: *See—*
Takai, Kazuki; Hakumoto, Mitsuhiro; and Yamada, Yasuo, 4,525,756, Cl. 360-75.000.
Yamagishi, Kagari: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Mitani, Kazuya, 4,525,356, Cl. 514-234.000.
Yamagishi, Takashi, to Turbo Kogyo Co., Ltd. Opposed type jet mill. 4,524,915, Cl. 241-39.000.

Yamaguchi, Norihisa: *See*—
Aoki, Akihiro; Hiratsuka, Shozaburo; Yamaguchi, Norihisa; and Makino, Shoji, 4,525,384, Cl. 427-174.000.
Yamaguchi, Yukio: *See*—
Tanaka, Toru; Iwatani, Kazutoshi; Enokido, Nobuo; Murakami, Atsushi; and Yamaguchi, Yukio, 4,525,554, Cl. 526-124.000.
Yamakoshi, Kenichi: *See*—
Kisioka, Kazuya; and Yamakoshi, Kenichi, 4,524,777, Cl. 128-677.000.
Yamamoto, Jun; Hayashida, Hajime; and Takahashi, Hiroyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Key-driving/detecting mechanism for keyboard instrument. 4,524,669, Cl. 84-433.000.
Yamamoto, Kimiaki: *See*—
Ito, Kenichi; Musha, Tohru; Kato, Kiichi; and Yamamoto, Kimiaki, 4,525,825, Cl. 369-45.000.
Yamamoto, Noriyoshi: *See*—
Kawamura, Hideo; Sagawa, Nobukazu; and Yamamoto, Noriyoshi, 4,525,622, Cl. 219-270.000.
Yamamoto, Ryoichi: *See*—
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,525,547, Cl. 526-68.000.
Yamanaka, Kazushi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for measurement of velocity of surface acoustic wave. 4,524,621, Cl. 73-597.000.
Yamane, Toshihiro; Ohashi, Kenzi; and Sakaguchi, Toshiharu, to Toray Industries, Inc.; and Tokyo Printing Ink Mfg. Co., Ltd. Electro-conductive thermoplastic resin foam and preparation process thereof. 4,525,297, Cl. 252-511.000.
Yamasaki, Harumasa: *See*—
Ito, Osamu; Yamasaki, Harumasa; Minakata, Itsuo; and Nishizawa, Kazunori, 4,524,577, Cl. 57-200.000.
Yamasaki, Hiro; Chin, Tung Jin; and Akiyama, Chuji, to Yokogawa Hokushin Electric Corporation. Electromagnetic flow meter. 4,524,627, Cl. 73-861.120.
Yamataka, Kazunori; and Isoya, Toshiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing dimethyl esters of higher dibasic acid. 4,525,251, Cl. 204-79.000.
Yamauchi, Junichi: *See*—
Omura, Ikuo; and Yamauchi, Junichi, 4,525,493, Cl. 523-116.000.
Yamauchi, Takashi; Maruhashi, Shigeaki; Koike, Shinkichi; and Yamada, Keizo, to Pacific Metals & Co. Ltd.; and Nisshin Steel Co. Ltd. Process for producing low P chromium-containing steel. 4,525,209, Cl. 75-51.500.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Light energy conversion system. 4,525,435, Cl. 429-111.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Light energy conversion system. 4,525,436, Cl. 429-111.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Light energy conversion system. 4,525,437, Cl. 429-111.000.
Yanagi, Masahiro: *See*—
Nakagawa, Koichiro; Suyama, Satoshi; Yanagi, Masahiro; and Nakajima, Yasutaka, 4,525,758, Cl. 360-133.000.
Yanagida, Shoji, to Ricoh Co., Ltd. Servomotor drive system. 4,525,658, Cl. 318-317.000.
Yanase, Shinji: *See*—
Kawai, Kyosuke; Nakagawa, Mitsuru; Yanase, Shinji; and Kawai, Kiyoshi, 4,525,190, Cl. 65-14.000.
Yang, Che-Ming: *See*—
Chen, Li F.; and Yang, Che-Ming, 4,525,218, Cl. 127-37.000.
Yang, John P.: *See*—
Barletta, Joseph M.; and Yang, John P., 4,525,713, Cl. 340-825.540.
Yarmchuk, Edward J.: *See*—
Franaszek, Peter A.; and Yarmchuk, Edward J., 4,525,724, Cl. 346-74.500.
Yaroshenko, Galina F.: *See*—
Kisil, Evgeny D.; Komova, Svetlana N.; Kulikova, Olga A.; Kutyanin, Leonid I.; Popova, Larisa V.; Dyatlova, Nina M.; Lastovsky, Rostislav P.; Yaroshenko, Galina F.; Khramov, Rem A.; Dytjuk, Leonid T.; Samakaev, Rafail K.; and Vasnev, Anatoly N., 4,525,293, Cl. 252-181.000.
Yasuda, Kenji: *See*—
Abe, Yumiko; and Yasuda, Kenji, 4,525,265, Cl. 204-403.000.
Toda, Shozo; Yasuda, Kenji; and Kokubo, Shozo, 4,525,276, Cl. 210-433.200.
Yasukawa, Motohiro; Ishikawa, Yukio; Ojima, Yasuo; Harada, Hiromi; and Mori, Yoshiaki, to Sumitomo Metal Mining Company Limited. Method for recovery of Zn and Pb from iron and steel dust. 4,525,208, Cl. 75-25.000.
Yasumoto, Hiromi, to Junkosha Company Ltd. Electrical connector. 4,525,020, Cl. 339-99.00R.
Yazawa, Hirosi: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,525,317, Cl. 264-235.800.
Yeater, Robert P., to Mobay Chemical Corporation. Polyester polyols and mixtures made therefrom. 4,525,575, Cl. 528-301.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,525,245, Cl. 203-51.000.
Yokogawa Hokushin Electric Corporation: *See*—
Yamasaki, Hiro; Chin, Tung Jin; and Akiyama, Chuji, 4,524,627, Cl. 73-861.120.
Yokoo, Hirokazu, to Fuji Photo Film Co., Ltd. Photographic camera having battery remaining life indicating means. 4,525,055, Cl. 354-468.000.
Yokota, Mitsuyoshi: *See*—
Matsumoto, Akio; and Yokota, Mitsuyoshi, 4,525,125, Cl. 417-44.000.
Yokoya, Satoshi, to Sony Corporation. Phase-locked loop circuit with variable bandwidth filter. 4,525,686, Cl. 331-17.000.
Yokoyama, Nobuaki: *See*—
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,525,718, Cl. 343-702.000.
Yonehara, Hiroyuki: *See*—
Takagi, Tsuneo; and Yonehara, Hiroyuki, 4,525,065, Cl. 355-77.000.
Yonehara, Yoriko: *See*—
Takagaki, Hidetsugu; Nakanishi, Shigenori; Tanaka, Yasuyuki; Watanabe, Michihiro; and Yonehara, Yoriko, 4,525,303, Cl. 260-239.55R.
Yonezawa, Keitaro, to Aioi Seiki Kabushiki Kaisha. Pneumatic-hydraulic driving device for the knockout mechanism associated with the slide of a press-machine. 4,524,660, Cl. 83-639.000.
Yonezawa, Toshio: *See*—
Nakamura, Hatsuo; Kato, Tiharu; Yonezawa, Toshio; Koguchi, Shigeo; Mori, Kiyoto; and Igarashi, Masahiko, 4,525,523, Cl. 524-572.000.
York, Ray A.: *See*—
Sheng, Shih Y.; and York, Ray A., 4,525,695, Cl. 335-262.000.
Yoshida, Hideaki: *See*—
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,525,434, Cl. 428-674.000.
Yoshida, Junichi: *See*—
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,525,547, Cl. 526-68.000.
Yoshida Kogyo K. K.: *See*—
Inamura, Akio, 4,524,493, Cl. 24-389.000.
Yunoki, Akio, 4,524,659, Cl. 83-80.000.
Yoshida, Mitsuaki; Sugano, Haruo; Shimizu, Fumio; and Imagawa, Kenichi, to Japanese Foundation for Cancer Research; and Otsuka Pharmaceutical Co., Ltd. Human leukemia virus-related peptides, antibodies of the peptides and a process for production of the antibodies. 4,525,300, Cl. 260-112.50R.
Yoshida, Yoshinobu: *See*—
Ohki, Nobutaka; and Yoshida, Yoshinobu, 4,525,451, Cl. 430-551.000.
Yoshikawa, Mamoru: *See*—
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,525,548, Cl. 526-72.000.
Yoshikawa, Shigeo: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Ando, Fumihiko; Yoshikawa, Shigeo; and Shimanuki, Koji, 4,525,742, Cl. 358-213.000.
Yoshikawa, Toshiharu: *See*—
Shibata, Takanori; Yoshikawa, Toshiharu; Isobe, Kenichi; and Ichinohe, Shoji, 4,525,563, Cl. 526-279.000.
Yoshimura, Tsuneo, to Mitsubishi Steel Mfg. Co., Ltd. Method of manufacturing leaded free-cutting steel by continuous casting process. 4,524,819, Cl. 164-468.000.
Yoshino, Kenji: *See*—
Tanaka, Masaru; Noguchi, Naoki; Yoshino, Kenji; and Saitoh, Osamu, 4,525,069, Cl. 356-435.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Arizono, Kenzo; Terasawa, Michio; and Nobutoki, Michiharu, 4,525,348, Cl. 424-81.000.
Yoshizumi, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Spring-operated mechanism. 4,524,637, Cl. 74-569.000.
Young, Kenneth P.: *See*—
Gullotti, Damian V.; Winter, Joseph; Young, Kenneth P.; and Evans, Robert D., 4,524,820, Cl. 164-476.000.
Young, Larry W.: *See*—
Mak, Randall L.; and Young, Larry W., 4,524,571, Cl. 56-98.000.
Young, Robert F.: *See*—
Broughton, George L.; Higby, Jeffrey P.; and Young, Robert F., 4,525,149, Cl. 440-1.000.
Young, Rodney C.: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,525,477, Cl. 514-333.000.
Yuasa, Hiromi: *See*—
Okawa, Tamotsu; and Yuasa, Hiromi, 4,525,799, Cl. 364-900.000.
Yunoki, Akio, to Yoshida Kogyo K. K. Apparatus for cutting continuous slide fastener chain. 4,524,659, Cl. 83-80.000.
Yurchenco, James R.; and Nuttall, Michael J., to MAD Computer, Inc. Monitor foot. 4,524,940, Cl. 248-359.000.
Yuwa Sangyo KK: *See*—
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Kashiyama, Hajime; and Shibata, Makoto, 4,524,562, Cl. 53-409.000.
Zaengel, Thomas: *See*—
Hubner, Horst; Lydtin, Hans; Rehder, Ludwig; and Zaengel, Thomas, 4,525,379, Cl. 427-53.100.
Zahir, Sheik A.: *See*—
Diethelm, Hermann; and Zahir, Sheik A., 4,525,572, Cl. 528-170.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Kondo, Shinichi, 4,525,299, Cl. 260-112.50R.
Zamboni, Valentino: *See*—
Moretti, Enrico; Zamboni, Valentino; Le Van Mao, Raymond; Padovan, Mario; and Solari, Marcello, 4,525,466, Cl. 502-63.000.
Zannucci, Joseph S.: *See*—
Morris, John C.; and Zannucci, Joseph S., 4,525,504, Cl. 524-99.000.

Zawadzki, Stanley C., Jr.; Stadelmaier, Robert A.; and Perrone, John J., to Cecos International, Inc. Transportation and disposal of waste materials. 4,525,100, Cl. 405-129.000.

ZeiBig, Gerhard: *See*—
Neumann, Manfred; Schiller, Siegfried; ZeiBig, Gerhard; Morgner, Henry; and Jasch, Gunter, 4,524,717, Cl. 118-718.000.

Zeilinger, Hans: *See*—
Stemmler, Bruno; and Zeilinger, Hans, 4,525,389, Cl. 427-255.100.

Zenith Electronics Corporation: *See*—
Borg, Arthur N., 4,525,740, Cl. 358-192.100.
Lai, Stephen H.; and Srivastava, Gopal K., 4,525,682, Cl. 330-288.000.
Templin, Frank C., 4,525,866, Cl. 455-186.000.

Zenner, Armin: *See*—
Rasshofer, Werner; Konig, Klaus; Meyborg, Holger; Meckel, Walter; and Zenner, Armin, 4,525,590, Cl. 544-222.000.

Zhdanovich, Larisa P.: *See*—
Feofanov, Vitaly A.; Pilat, Boris V.; Zhdanovich, Larisa P.; Romanenko, Anatoly G.; Lukhanin, Boris S.; Donets, Oleg V.; and Korobochkin, Valery P., 4,525,254, Cl. 204-150.000.

Ziegelmeyer, Harold R. Force multiplying locking arrangement. 4,525,097, Cl. 403-259.000.

Ziegler, Rolf; and Hauk, Peter, to Mavilor Systemes S.A. Epicyclic gear. 4,524,643, Cl. 74-801.000.

Zimmer, Johannes: *See*—
Glantschnig, Josef, 4,524,688, Cl. 101-123.000.

Zimmerly, Harry L. Break-away inflator. 4,524,885, Cl. 222-5.000.

Zimmerman, Luther L.: *See*—
Hoffman, Harry S., Jr.; Thompson, Donald R.; and Zimmerman, Luther L., 4,525,707, Cl. 340-707.000.

Zink, Rudolf, to Ciba Geigy Corporation. Chromogenic naphtholactams. 4,525,588, Cl. 544-89.000.

Zito, Santo W.; and Staba, E. John, to University of Minnesota, Regents of the. Method for preparing a cell free homogenate of *Chrysanthemum cinerariaefolium* (Trev.) Bocc. containing enzymes and methods of use. 4,525,455, Cl. 435-135.000.

Zizan, John P., to Robroy Industries. Buckle connection for hanging cable. 4,524,937, Cl. 248-74.300.

Zochowski, John S. Amplifier. 4,525,872, Cl. 455-344.000.

Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,525,205, Cl. 71-108.000.

Zukosky, Mimzee; and Dieck, Ronald L., to Raychem Corporation. Polymeric compositions suitable for use in the medical field and containing a polyolefin, a polysiloxane and an elastomer. 4,525,531, Cl. 525-92.000.

Zupfer, David F.: *See*—
Nowak, David J.; and Zupfer, David F., 4,525,006, Cl. 294-19.100.

501 S.C.R. Engineers, Ltd.: *See*—
Brayer, Eyal, 4,524,720, Cl. 119-14.140.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JUNE, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beloit Corporation: *See—*
Justus, Edgar J.; and Roerig, Arnold J., Re. 31,923, Cl. 162-358.000.

Biohumus, Inc.: *See—*
Starr, Jerry, deceased, Re. 31,924, Cl. 210-610.000.

Boehringer Ingelheim GmbH: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Burroughs Corporation: *See—*
Miller, Donald E., Re. 31,928, Cl. 313-631.000.

Christensen, Gordon D.: *See—*
Donaher, Charles J.; and Christensen, Gordon D., Re. 31,929, Cl. 361-393.000.

Clear, Theodore E.; and Miller, Robert. Methods and apparatus for stacking cementitious reinforced panels. Re. 31,921, Cl. 414-82.000.

Coffee, Ronald A.; Young, Brian W.; and Middleton, Michael R., to Imperial Chemical Industries PLC. Electrostatically sprayable insecticidal formulations. Re. 31,927, Cl. 514-521.000.

Donaher, Charles J.; and Christensen, Gordon D., to Thomas & Betts Corporation. Electronic package and accessory component assembly. Re. 31,929, Cl. 361-393.000.

Goeth, Hanns: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Imperial Chemical Industries PLC: *See—*
Coffee, Ronald A.; Young, Brian W.; and Middleton, Michael R., Re. 31,927, Cl. 514-521.000.

Jenks, Richard H.; and Kipp, Egbert M., to Revere Copper and Brass Incorporated. Process for compression rolling of polymeric films. Re. 31,925, Cl. 264-280.000.

Johnson & Johnson: *See—*
Mesek, Frederick K.; and Mesek, Virginia R., Re. 31,922, Cl. 604-385.00A.

Justus, Edgar J.; and Roerig, Arnold J., to Beloit Corporation. Extended nip press. Re. 31,923, Cl. 162-358.000.

Kipp, Egbert M.: *See—*
Jenks, Richard H.; and Kipp, Egbert M., Re. 31,925, Cl. 264-280.000.

Lechner, Uwe: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Maier, Roland: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl 514-157.000.

Mesek, Frederick K.; and Mesek, Virginia R., to Johnson & Johnson. Conformable disposable diapers having absorbent panel with bulged side members. Re. 31,922, Cl. 604-385.00A.

Mesek, Virginia R.: *See—*
Mesek, Frederick K.; and Mesek, Virginia R., Re. 31,922, Cl. 604-385.00A.

Middleton, Michael R.: *See—*
Coffee, Ronald A.; Young, Brian W.; and Middleton, Michael R., Re. 31,927, Cl. 514-521.000.

Miller, Donald E., to Burroughs Corporation. Display panel for displaying a bar of light. Re. 31,928, Cl. 313-631.000.

Miller, Robert: *See—*
Clear, Theodore E.; and Miller, Robert, Re. 31,921, Cl. 414-82.000.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel having support for a deflected spool shaft. Re. 31,920, Cl. 242-212.000.

Reuter, Wolfgang: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Revere Copper and Brass Incorporated: *See—*
Jenks, Richard H.; and Kipp, Egbert M., Re. 31,925, Cl. 264-280.000.

Roerig, Arnold J.: *See—*
Justus, Edgar J.; and Roerig, Arnold J., Re. 31,923, Cl. 162-358.000.

Shimano Industrial Company Limited: *See—*
Noda, Hideo, Re. 31,920, Cl. 242-212.000.

Starr, Jerry, deceased (by Williams, Walter C., administrator), to Biohumus, Inc. Composition and method for stimulation of bacteria. Re. 31,924, Cl. 210-610.000.

Thomas & Betts Corporation: *See—*
Donaher, Charles J.; and Christensen, Gordon D., Re. 31,929, Cl. 361-393.000.

Werner, Rolf: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, to Boehringer Ingelheim GmbH. Penicillins and salts thereof. Re. 31,926, Cl. 514-157.000.

Williams, Walter C., administrator: *See—*
Starr, Jerry, deceased, Re. 31,924, Cl. 210-610.000.

Woitun, Eberhard: *See—*
Wetzel, Bernd; Reuter, Wolfgang; Woitun, Eberhard; Maier, Roland; Lechner, Uwe; Goeth, Hanns; and Werner, Rolf, Re. 31,926, Cl. 514-157.000.

Young, Brian W.: *See—*
Coffee, Ronald A.; Young, Brian W.; and Middleton, Michael R., Re. 31,927, Cl. 514-521.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Eyberger, Harry, to Vamco Machine and Tool, Inc. Self-contained feed roll for power punch presses. B1 1,029,795, 6-25-85, Cl. 83-245.000.

Grise , Frederick G. J. Pipe freezing device. B1 3,742,723, 6-25-85, Cl. 62-293.000.

Vamco Machine and Tool, Inc.: *See—*
Eyberger, Harry, B1 1,029,795, Cl. 83-245.000.

LIST OF DESIGN PATENTEES

Abe, Noboru; and Seiffert, Florian, to Matsushita Electric Works, Ltd. Electric hair clipper. 279,411, 6-25-85, Cl. D28-53.000.

Advanced Plastics, Inc.: *See*—
Waters, John E., 279,368, Cl. D12-157.000.

Agan, Richard P.; and Dunahoo, Anna L. A combined straddle seat and arm rest. 279,334, 6-25-85, Cl. D6-354.000.

Allen, George A., Jr. Combined smoke gasket and intumescent expanding seal device for sliding elevator doors and the like. 279,409, 6-25-85, Cl. D25-74.000.

Allergan Pharmaceuticals, Inc.: *See*—
Mitchell, David W., 279,357, Cl. D9-450.000.

American Standard Inc.: *See*—
Hiller, Dorothee, 279,404, Cl. D23-62.000.

Arrington, Galen C.; Christ, Allen E.; Keller, Theodore W.; and Eichhorn, Clark W., to Arrington, Galen C. Phonograph. 279,371, 6-25-85, Cl. D14-16.000.

AT&T Teletype Corporation: *See*—
Genaro, Donald M.; and Tilley, Alvin R., 279,375, Cl. D14-113.000.

Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, to Matsushita Electric Industrial Co. Telephone answering machine with handset. 279,372, 6-25-85, Cl. D14-52.000.

Balducci, Andrew. Combined display case fish tank. 279,413, 6-25-85, Cl. D30-11.000.

Ballew, Julius R. Shock absorber. 279,370, 6-25-85, Cl. D12-159.000.

Benigni, Paul E.; Boulay, Steven G.; and Costello, John C., to Digital Equipment Corporation. Computer housing. 279,374, 6-25-85, Cl. D14-100.000.

Binney & Smith: *See*—
Lieberman, Sheldon, 279,385, Cl. D19-77.000.

Boulay, Steven G.: *See*—
Benigni, Paul E.; Boulay, Steven G.; and Costello, John C., 279,374, Cl. D14-100.000.

Brewster, Gerald E. Paper roll holder. 279,343, 6-25-85, Cl. D6-522.000.

Brown Jordan Company: *See*—
Frinier, Richard; and Criqui, Eugene A., 279,335, Cl. D6-361.000.

Brown, Kenneth T.; and Brown, Virginia W. Convertible cradle. 279,333, 6-25-85, Cl. D6-335.000.

Brown, Virginia W.: *See*—
Brown, Kenneth T.; and Brown, Virginia W., 279,333, Cl. D6-335.000.

Cal-Comp Electronice, Inc.: *See*—
Leung, Chee-Chun, 279,381, Cl. D18-2.000.

Certech Incorporated: *See*—
Uram, Stuart Z., 279,379, Cl. D15-138.000.

Chan, Bing Y., to Goodway Electrical Company Ltd. Iron. 279,416, 6-25-85, Cl. D32-69.000.

Cheek, Cecil R.: *See*—
Davenport, Robert M.; and Cheek, Cecil R., 279,408, Cl. D25-25.000.

Christ, Allen E.: *See*—
Arrington, Galen C.; Christ, Allen E.; Keller, Theodore W.; and Eichhorn, Clark W., 279,371, Cl. D14-16.000.

Clivio, Franco; and Raffler, Dieter, to Gardena Kress+Kastner GmbH. Grip for garden utensils. 279,347, 6-25-85, Cl. D8-1.000.

Clivio, Franco; and Raffler, Dieter, to GARDENA Kress+Kastner GmbH. Garden utensil. 279,348, 6-25-85, Cl. D8-11.000.

Clivio, Franco; and Raffler, Dieter, to GARDENA Kress+Kastner GmbH. Garden rake. 279,349, 6-25-85, Cl. D8-13.000.

Coats & Clark, Inc.: *See*—
Dunn, James R., 279,386, Cl. D19-91.000.
Dunn, James R., 279,387, Cl. D19-91.000.
Dunn, James R., 279,388, Cl. D19-91.000.

Coleman, Ernest G. Toy flying saucer. 279,394, 6-25-85, Cl. D21-86.000.

Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 279,353, Cl. D9-349.000.

Costello, John C.: *See*—
Benigni, Paul E.; Boulay, Steven G.; and Costello, John C., 279,374, Cl. D14-100.000.

Crawford, John W. Holder for empty cassette case. 279,342, 6-25-85, Cl. D6-466.000.

Criqui, Eugene A.: *See*—
Frinier, Richard; and Criqui, Eugene A., 279,335, Cl. D6-361.000.

Danner, James. Chess piece. 279,390, 6-25-85, Cl. D21-52.000.

Danner, James. Chess piece. 279,391, 6-25-85, Cl. D21-52.000.

Danner, James. Chess piece. 279,392, 6-25-85, Cl. D21-52.000.

Davenport, Robert M.; and Cheek, Cecil R., to Robert M. Davenport Company. Food service building. 279,408, 6-25-85, Cl. D25-25.000.

Davidson, William G., to Harley-Davidson Motor Co., Inc. Motorcycle engine head. 279,376, 6-25-85, Cl. D15-5.000.

Diffrient, Niels, to Knoll International, Inc. Combined seat and backrest unit for an office chair. 279,332, 6-25-85, Cl. D6-379.000.

Digital Equipment Corporation: *See*—
Benigni, Paul E.; Boulay, Steven G.; and Costello, John C., 279,374, Cl. D14-100.000.

Doman, Donald W., to Kohler Co. Faucet handle. 279,403, 6-25-85, Cl. D23-28.000.

Douglas, Thomas B.; and Dunklin, A. Clark. Billboard display apparatus. 279,389, 6-25-85, Cl. D20-39.000.

Dunahoo, Anna L.: *See*—
Agan, Richard P.; and Dunahoo, Anna L., 279,334, Cl. D6-354.000.

Duncan, Andrew, to Pluto Furniture (Sales) Pty. Ltd. Chair. 279,336, 6-25-85, Cl. D6-368.000.

Dunklin, A. Clark: *See*—
Douglas, Thomas B.; and Dunklin, A. Clark, 279,389, Cl. D20-39.000.

Dunlop Limited: *See*—
Fukumoto, Tetsuhiro; and Ochiai, Kiyoshi, 279,363, Cl. D12-143.000.

Dunn, Edward G., Jr.: *See*—
Dunn, Edward G., Sr.; and Dunn, Edward G., Jr., 279,400, Cl. D21-232.000.

Dunn, Edward G., Sr.; and Dunn, Edward G., Jr. Portable outdoor bumper pool table. 279,400, 6-25-85, Cl. D21-232.000.

Dunn, James R., to Coats & Clark, Inc. Party needs memo holder. 279,386, 6-25-85, Cl. D19-91.000.

Dunn, James R., to Coats & Clark, Inc. Menu memo holder. 279,387, 6-25-85, Cl. D19-91.000.

Dunn, James R., to Coats & Clark, Inc. Invitation list memo holder. 279,388, 6-25-85, Cl. D19-91.000.

Durand, Philippe J. Plate or similar article. 279,345, 6-25-85, Cl. D7-28.000.

Dvorak, Edward E. Ear tag for animals. 279,414, 6-25-85, Cl. D30-43.000.

Dzak, Stephen. Support for mounting radios in a vehicle having bench seats. 279,329, 6-25-85, Cl. D3-40.000.

Eichhorn, Clark W.: *See*—
Arrington, Galen C.; Christ, Allen E.; Keller, Theodore W.; and Eichhorn, Clark W., 279,371, Cl. D14-16.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 279,384, Cl. D19-75.000.

Eric Marshall Associates Limited: *See*—
Marshall, Eric J., 279,373, Cl. D14-53.000.

Essex Chair Company: *See*—
Testa, Stefano, 279,339, Cl. D6-384.000.

Etna Products Co., Inc.: *See*—
Fung, May, 279,412, Cl. D28-58.000.

Evenson, Mel, to Eldon Industries, Inc. Drawer insert for a desk storage tray system. 279,384, 6-25-85, Cl. D19-75.000.

Fetty, Harold D.: *See*—
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 279,367, Cl. D12-149.000.

Fiorentino, Imero; and Marshall, William G., to Imero Fiorentino Associates, Inc. Garden lighting fixture. 279,410, 6-25-85, Cl. D26-69.000.

Foldes, Steven M., to Fun Footwear, Co. Shoe and the like. 279,325, 6-25-85, Cl. D2-282.000.

Foldes, Steven M., to Fun Footwear, Co. Shoe and the like. 279,326, 6-25-85, Cl. D2-298.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Packaging cup with a pedestal base. 279,353, 6-25-85, Cl. D9-349.000.

Frinier, Richard; and Criqui, Eugene A., to Brown Jordan Company. Chaise frame. 279,335, 6-25-85, Cl. D6-361.000.

Fukumoto, Tetsuhiro; and Ochiai, Kiyoshi, to Dunlop Limited. Tire for a vehicle wheel. 279,363, 6-25-85, Cl. D12-143.000.

Fun Footwear, Co.: *See*—
Foldes, Steven M., 279,325, Cl. D2-282.000.
Foldes, Steven M., 279,326, Cl. D2-298.000.

Fung, May, to Etna Products Co., Inc. Fingernail dryer. 279,412, 6-25-85, Cl. D28-58.000.

Game Time, Inc.: *See*—
West, Donald E., 279,401, Cl. D21-245.000.

Gamm, Robert J., to Kangaroos U.S.A. Inc. Athletic boot with pocket. 279,327, 6-25-85, Cl. D2-310.000.

Gardena Kress+Kastner GmbH: *See*—
Clivio, Franco; and Raffler, Dieter, 279,347, Cl. D8-1.000.
Clivio, Franco; and Raffler, Dieter, 279,348, Cl. D8-11.000.
Clivio, Franco; and Raffler, Dieter, 279,349, Cl. D8-13.000.

Genaro, Donald M.; and Tilley, Alvin R., to AT&T Teletype Corporation. CRT display cabinet. 279,375, 6-25-85, Cl. D14-113.000.

General Corporation, The: *See*—
Hori, Susumu; Kaneko, Shinichi; and Suzuki, Hiroaki, 279,382, Cl. D18-4.000.

Gerch, Edward L. Combined attache case and travelling desk. 279,330, 6-25-85, Cl. D3-76.000.

Gibello, Carlo. Tennis racquet. 279,397, 6-25-85, Cl. D21-212.000.

Gibello, Carlo. Tennis racquet. 279,398, 6-25-85, Cl. D21-212.000.

Gibson, Charles C. Combined stand and container for storing and dispensing gasoline or the like. 279,402, 6-25-85, Cl. D23-2.000.

Goeckeler, William P.: *See*—
Stevens, Max L.; and Goeckeler, William P., 279,419, Cl. D99-29.000.

Goodway Electrical Company Ltd.: *See*—
Chan, Bing Y., 279,416, Cl. D32-69.000.

Goodyear Tire & Rubber Company, The: *See*—
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 279,367, Cl. D12-149.000.

Graphic Controls Corporation: *See*—
Hubbard, James R., 279,407, Cl. D24-53.000.

Green, Herbert. Toy trackway. 279,395, 6-25-85, Cl. D21-92.000.

Griffith, Jeremy N. Chair. 279,331, 6-25-85, Cl. D6-379.000.

Hamatani, George. Combined rocker box handle and rocker arm positioner. 279,350, 6-25-85, Cl. D8-71.000.

Harley-Davidson Motor Co., Inc.: *See*—
Davidson, William G., 279,376, Cl. D15-5.000.
Helmer, Henry W. Pallet. 279,418, 6-25-85, Cl. D34-38.000.
Hewitt, Howard: *See*—
Mitchell, Diana L.; and Hewitt, Howard, 279,352, Cl. D8-354.000.
Hilko, Steven E., to Quaker Oats Company, The. Stacking toy. 279,393, 6-25-85, Cl. D21-59.000.
Hillebrand, Thomas W.; and Sonntag, Clemens A., to Parker Pen Company. Ball point writing instrument. 279,383, 6-25-85, Cl. D19-51.000.
Hiller, Dorothee, to American Standard Inc. Lavatory or similar article. 279,404, 6-25-85, Cl. D23-62.000.
Hori, Susumu; Kaneko, Shinichi; and Suzuki, Hiroaki, to General Corporation, The. Cash register or similar article. 279,382, 6-25-85, Cl. D18-4.000.
Hubachek, Louis H. Jewelry pin. 279,360, 6-25-85, Cl. D11-71.000.
Hubbard, James R., to Graphic Controls Corporation. Catheter flush flow control device. 279,407, 6-25-85, Cl. D24-53.000.
Igloo Corporation: *See*—
Ruxton, Craig, 279,346, Cl. D7-77.000.
Imero Fiorentino Associates, Inc.: *See*—
Fiorentino, Imero; and Marshall, William G., 279,410, Cl. D26-69.000.
Kaneko, Shinichi: *See*—
Hori, Susumu; Kaneko, Shinichi; and Suzuki, Hiroaki, 279,382, Cl. D18-4.000.
Kangaroos U.S.A. Inc.: *See*—
Gamm, Robert J., 279,327, Cl. D2-310.000.
Keller, Theodore W.: *See*—
Arrington, Galen C.; Christ, Allen E.; Keller, Theodore W.; and Eichhorn, Clark W., 279,371, Cl. D14-16.000.
Kimura, Akiko: *See*—
Shimmi, Shigeru; and Kimura, Akiko, 279,328, Cl. D3-35.000.
Knoll International, Inc.: *See*—
Diffrient, Niels, 279,332, Cl. D6-379.000.
Kohler Co.: *See*—
Doman, Donald W., 279,403, Cl. D23-28.000.
Kohler, Herbert V., Jr., 279,344, Cl. D6-596.000.
Kohler, Herbert V., Jr., to Kohler Co. Bathtub pillow. 279,344, 6-25-85, Cl. D6-596.000.
Kuchar, Walter, to Tri-Service Machine Ltd. Duplex mud pump. 279,377, 6-25-85, Cl. D15-7.000.
Kurosu, Teisuke: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 279,372, Cl. D14-52.000.
Kusube, Haruo, to Sumitomo Rubber Industries, Ltd. Vehicle tire. 279,364, 6-25-85, Cl. D12-146.000.
Larsson, Bertil, to Stalvall & Larsson Forsaljnings AB. Balance arm for supporting working tools. 279,378, 6-25-85, Cl. D15-138.000.
Lassiter, Will M. Trailer king pin lock. 279,351, 6-25-85, Cl. D8-331.000.
Lentz, William C. Comedone extractor. 279,405, 6-25-85, Cl. D24-23.000.
Leung, Chee-Chun, to Cal-Comp Electronice, Inc. Calculator ruler or similar article. 279,381, 6-25-85, Cl. D18-2.000.
Liberty Glass Company: *See*—
Moss, James F., 279,356, Cl. D9-434.000.
Lichtman, Larry A., to Sunset Time, Inc. Growth chart. 279,358, 6-25-85, Cl. D10-71.000.
Lieberman, Sheldon, to Binney & Smith. Drawing implement storage device. 279,385, 6-25-85, Cl. D19-77.000.
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 279,367, 6-25-85, Cl. D12-149.000.
Loeffler, Ronald L.: *See*—
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 279,367, Cl. D12-149.000.
Marcus, Paul. Bottle or the like. 279,354, 6-25-85, Cl. D9-351.000.
Marshall, Eric J., to Eric Marshall Associates Limited. Telephone. 279,373, 6-25-85, Cl. D14-53.000.
Marshall, William G.: *See*—
Fiorentino, Imero; and Marshall, William G., 279,410, Cl. D26-69.000.
Matrix International Industries: *See*—
Shiu, Desmond K., 279,406, Cl. D24-36.000.
Matsushita Electric Industrial Co.: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 279,372, Cl. D14-52.000.
Matsushita Electric Works, Ltd.: *See*—
Abe, Noboru; and Seiffert, Florian, 279,411, Cl. D28-53.000.
Mitchell, David W., to Allergan Pharmaceuticals, Inc. Bottle cap. 279,357, 6-25-85, Cl. D9-450.000.
Mitchell, Diana L.; and Hewitt, Howard. Concrete reinforcing rod spacer. 279,352, 6-25-85, Cl. D8-354.000.
Mohly Shop Co., Ltd.: *See*—
Nakamura, Noboru, 279,337, Cl. D6-371.000.
Moss, James F., to Liberty Glass Company. Bottle carrier. 279,356, 6-25-85, Cl. D9-434.000.
Nakamura, Noboru, to Mohly Shop Co., Ltd. Chair. 279,337, 6-25-85, Cl. D6-371.000.
Neumunz, Helen V. Putting guide golf club attachment. 279,399, 6-25-85, Cl. D21-221.000.
Ochiai, Kiyoshi: *See*—
Fukumoto, Tetsuhiro; and Ochiai, Kiyoshi, 279,363, Cl. D12-143.000.
Offredi, Giovanni. Chair. 279,338, 6-25-85, Cl. D6-376.000.
Ohta, Fumiharu: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 279,372, Cl. D14-52.000.
Osrow, Harold; and Osrow, Richard, to Osrow Products Corporation. Illuminated ice scraper. 279,415, 6-25-85, Cl. D32-49.000.
Osrow Products Corporation: *See*—
Osrow, Harold; and Osrow, Richard, 279,415, Cl. D32-49.000.
Osrow, Richard: *See*—
Osrow, Harold; and Osrow, Richard, 279,415, Cl. D32-49.000.
Parker Pen Company: *See*—
Hillebrand, Thomas W.; and Sonntag, Clemens A., 279,383, Cl. D19-51.000.
Peckels, Kenneth T.; and Peckels, William M. Ice fishing sled. 279,361, 6-25-85, Cl. D12-9.000.
Peckels, William M.: *See*—
Peckels, Kenneth T.; and Peckels, William M., 279,361, Cl. D12-9.000.
Plastofilm Industries, Inc.: *See*—
Simmons, Richard J., 279,341, Cl. D6-466.000.
Plauny, Jeffrey L.: *See*—
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 279,367, Cl. D12-149.000.
Pluto Furniture (Sales) Pty. Ltd.: *See*—
Duncan, Andrew, 279,336, Cl. D6-368.000.
Quaker Oats Company, The: *See*—
Hilko, Steven E., 279,393, Cl. D21-59.000.
Raffler, Dieter: *See*—
Clivio, Franco; and Raffler, Dieter, 279,347, Cl. D8-1.000.
Clivio, Franco; and Raffler, Dieter, 279,348, Cl. D8-11.000.
Clivio, Franco; and Raffler, Dieter, 279,349, Cl. D8-13.000.
Robert M. Davenport Company: *See*—
Davenport, Robert M.; and Cheek, Cecil R., 279,408, Cl. D25-25.000.
Ruxton, Craig, to Igloo Corporation. Jug. 279,346, 6-25-85, Cl. D7-77.000.
Seiffert, Florian: *See*—
Abe, Noboru; and Seiffert, Florian, 279,411, Cl. D28-53.000.
Shimmi, Shigeru; and Kimura, Akiko. Cassette Holder or similar article. 279,328, 6-25-85, Cl. D3-35.000.
Shiu, Desmond K., to Matrix International Industries. Massage roller. 279,406, 6-25-85, Cl. D24-36.000.
Simmons, Richard J., to Plastofilm Industries, Inc. Stackable tray for displaying and dispensing cylindrical packaged articles. 279,341, 6-25-85, Cl. D6-466.000.
Sink, John B. Chair restraining device. 279,362, 6-25-85, Cl. D12-133.000.
Sonntag, Clemens A.: *See*—
Hillebrand, Thomas W.; and Sonntag, Clemens A., 279,383, Cl. D19-51.000.
Sony Corporation: *See*—
Ujiie, Masumi, 279,355, Cl. D9-432.000.
Spear, Francis, to Systems Manufacturing Corporation. Adjustable stand for a computer keyboard or the like. 279,340, 6-25-85, Cl. D6-429.000.
Speers, Samuel F. Miniaturized basketball backboard. 279,396, 6-25-85, Cl. D21-201.000.
Spencer, Treesa A. Infectious waste container for use in hospitals and other health care facilities. 279,417, 6-25-85, Cl. D34-1.000.
Stalvall & Larsson Forsaljnings AB.: *See*—
Larsson, Bertil, 279,378, Cl. D15-138.000.
Stevens, Max L.; and Goeckeler, William P., to 24 Hour Postal Center, Inc. Postal center unit. 279,419, 6-25-85, Cl. D99-29.000.
Stich, Willi L. Acoustic pickup for stringed instrument. 279,380, 6-25-85, Cl. D17-20.000.
Sumitomo Rubber Industries, Inc.: *See*—
Takehara, Kenji, 279,366, Cl. D12-147.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Kusube, Haruo, 279,364, Cl. D12-146.000.
Takehara, Kenji, 279,365, Cl. D12-147.000.
Sunset Time, Inc.: *See*—
Lichtman, Larry A., 279,358, Cl. D10-71.000.
Suzuki, Hiroaki: *See*—
Hori, Susumu; Kaneko, Shinichi; and Suzuki, Hiroaki, 279,382, Cl. D18-4.000.
Systems Manufacturing Corporation: *See*—
Spear, Francis, 279,340, Cl. D6-429.000.
Szigeti, Elemer. Wristwatch case face and knob. 279,359, 6-25-85, Cl. D10-126.000.
Takehara, Kenji, to Sumitomo Rubber Industries, Ltd. Vehicle tire. 279,365, 6-25-85, Cl. D12-147.000.
Takehara, Kenji, to Sumitomo Rubber Industries, Inc. Vehicle tire. 279,366, 6-25-85, Cl. D12-147.000.
Takenaka, Kazumasa: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 279,372, Cl. D14-52.000.
Testa, Stefano, to Essex Chair Company. Combined loft bed and cabinet assembly or similar article. 279,339, 6-25-85, Cl. D6-384.000.
Tilley, Alvin R.: *See*—
Genaro, Donald M.; and Tilley, Alvin R., 279,375, Cl. D14-113.000.
Tri-Service Machine Ltd.: *See*—
Kuchar, Walter, 279,377, Cl. D15-7.000.
Ujiie, Masumi, to Sony Corporation. Packing box for video cassettes. 279,355, 6-25-85, Cl. D9-432.000.
Uram, Stuart Z., to Certech Incorporated. Molten metals filter. 279,379, 6-25-85, Cl. D15-138.000.
Van Vlandren, Gary. Utility box for bicycles. 279,369, 6-25-85, Cl. D12-158.000.
Watanabe, Satoshi: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 279,372, Cl. D14-52.000.
Waters, John E., to Advanced Plastics, Inc. Truck tool box. 279,368, 6-25-85, Cl. D12-157.000.
West, Donald E., to Game Time, Inc. Playground climber. 279,401, 6-25-85, Cl. D21-245.000.
24 Hour Postal Center, Inc.: *See*—
Stevens, Max L.; and Goeckeler, William P., 279,419, Cl. D99-29.000.

LIST OF PLANT PATENTEES

B. V. Handelskwekerij, M. C. van Staaveren: *See*—
van Andel, Jacob, 5,498, Cl. 73.000.
van Andel, Jacob, 5,499, Cl. 70.000.
Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Charm. 5,502, 6-25-85, Cl. 76.000.
Handelskwekerij, B. V.: *See*—
van Andel, Jacob, 5,500, Cl. 73.000.
van Andel, Jacob, 5,501, Cl. 68.000.
van Andel, Jacob, to B. V. Handelskwekerij, M. C. van Staaveren. Carnation named Stanpiran. 5,498, 6-25-85, Cl. 73.000.
van Andel, Jacob, to B. V. Handelskwekerij, M. C. van Staaveren. Carnation named Stanblanca. 5,499, 6-25-85, Cl. 70.000.
van Andel, Jacob, to Handelskwekerij, B. V.; and van Staaveren, M. C. Carnation named Muredo. 5,500, 6-25-85, Cl. 73.000.
van Andel, Jacob, to Handelskwekerij, B. V.; and van Staaveren, M. C. Alstroemeria named Stalrobu. 5,501, 6-25-85, Cl. 68.000.
van Staaveren, M. C.: *See*—
van Andel, Jacob, 5,500, Cl. 73.000.
van Andel, Jacob, 5,501, Cl. 68.000.
Yoder Brothers, Inc.: *See*—
Duffett, William E., 5,502, Cl. 76.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 25, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

105 4,524,463
161 A 4,524,464
424 4,524,465

CLASS 4

216 4,524,469
253 4,524,470

CLASS 5

8 4,524,471
62 4,524,472
481 4,524,473
484 4,524,474
507 4,524,475

CLASS 6

1 4,524,476

CLASS 8

130.1 4,525,168
485 4,525,169
524 4,525,170

CLASS 15

50 R 4,524,477
106 4,524,478
147 R 4,524,479
159 A 4,524,480
250.41 4,524,481

CLASS 16

44 4,524,482
114 R 4,524,483
115 4,524,484
364 4,524,485
381 4,524,486

CLASS 17

1 E 4,524,487
11 4,524,488
4,524,489
48 4,524,490
52 4,524,491

CLASS 19

107 4,524,492

CLASS 23

300 4,525,171

CLASS 24

389 4,524,493
453 4,524,494
590 4,524,495

CLASS 27

18 4,524,496

CLASS 29

25.35 4,524,497
156.4 WL 4,524,498
156.8 B 4,524,499
157 R 4,524,500
237 4,524,501
268 4,524,502
407 4,524,503
450 4,524,504
453 4,524,505
4,524,506
564.2 4,524,507
571 4,524,508
623.5 4,524,509
861 4,524,510

CLASS 30

108 4,524,511
147 4,524,512
149 4,524,513
169 4,524,514
276 4,524,515
290 4,524,516
324 4,524,517
330 4,524,518
382 4,524,519

CLASS 33

1 AA 4,524,521
1 M 4,524,520
11 4,524,522
143 L 4,524,523
147 M 4,524,524
178 B 4,524,525
312 4,524,526
451 4,524,527

CLASS 34

102 4,524,528

CLASS 36

98 4,524,529
113 4,524,530
127 4,524,531

CLASS 37

117.5 4,524,532

CLASS 40

607 4,524,533

CLASS 42

1 S 4,524,534

CLASS 43

4.5 4,524,535
17.2 4,524,536
36 4,524,537
43.13 4,524,538
44.87 4,524,539
44.98 4,524,540

CLASS 44

32 4,525,172
51 4,525,173
68 4,525,174

CLASS 47

58 4,524,541
67 4,524,542

CLASS 48

86 R 4,525,175
197 R 4,525,176

CLASS 51

34 R 4,524,543
92 R 4,524,544
99 4,524,545
165 R 4,524,546
165.77 4,524,547
295 4,525,177
309 4,525,178
4,525,179
322 4,524,548
347 4,524,549
424 4,524,550

CLASS 52

98 4,524,551
108 4,524,552
169.11 4,524,553
693 4,524,554
738 4,524,555
807 4,524,556

CLASS 53

55 4,524,557
157 4,524,558
219 4,524,559
374 4,524,560
397 4,524,561
409 4,524,562
426 4,524,563
449 4,524,564
4,524,565
534 4,524,566
552 4,524,567
556 4,524,568

CLASS 54

24 4,524,569
44 4,524,570

CLASS 55

37 4,525,180
71 4,525,181
159 4,525,182
179 4,525,183
302 4,525,184

CLASS 56

98 4,524,571
327 R 4,524,572
330 4,524,573
341 4,524,574
372 4,524,575
4,524,576

CLASS 57

200 4,524,577
263 4,524,578
276 4,524,579
401 4,524,580

CLASS 60

39.02 4,524,581
421 4,524,582
525 4,524,583
554 4,524,584
562 4,524,585

CLASS 62

6 4,524,586
11 4,525,185
22 4,525,186
31 4,525,187
101 4,524,587
262 4,524,588
293 B1 3,742,723

CLASS 65

1 4,525,188
3.15 4,525,189
14 4,525,190
83 4,525,191
110 4,525,192
114 4,525,193
145 4,525,194
260 4,525,195
287 4,525,196

CLASS 68

5 D 4,524,589

CLASS 70

129 4,524,590
236 4,524,591
287 4,524,592
358 4,524,593
456 R 4,524,594

CLASS 71

11 4,525,197
28 4,525,198
76 4,525,200
4,525,201
86 4,525,202
88 4,525,203
92 4,525,204
108 4,525,205

CLASS 72

84 4,524,595
133 4,524,596
135 4,524,597
198 4,524,598
321 4,524,599
391 4,524,600
422 4,524,601

CLASS 73

9 4,524,602
12 4,524,603
38 4,524,604
4,524,605
40 4,524,606
40.5 R 4,524,607
4,524,608
49.2 4,524,609
54 4,524,610
59 4,524,611
117.3 4,524,612
119 A 4,524,613
147 4,524,614
181 4,524,615
203 4,524,616
296 4,524,617
323 4,524,618
505 4,524,619
587 4,524,620
597 4,524,621
620 4,524,622
633 4,524,623
708 4,524,624
754 4,524,625
784 4,524,626
861.12 4,524,627
863.43 4,524,628

CLASS 74

7 R 4,524,629
110 4,524,630
388 PS 4,524,631
471 R 4,524,632
473 R 4,524,633
4,524,634
476 4,524,635
527 4,524,636
569 4,524,637
606 R 4,524,638
640 4,524,639
650 4,524,640
691 4,524,641
796 4,524,642
801 4,524,643
804 4,524,644
866 4,524,645

CLASS 75

0.5 BA 4,525,206
3 4,525,207
25 4,525,208
51.5 4,525,209
58 4,525,210
4,525,211
68 R 4,525,212

CLASS 81

3.55 4,524,646
57.13 4,524,649
57.39 4,524,650
4,524,651
63 4,524,652
4,524,653

CLASS 82

3 4,524,654
36 A 4,524,655

CLASS 83

23 4,524,656
69 4,524,657
80 4,524,659
152 4,524,658
245 B1 Re.29,795
639 4,524,660
690 4,524,661
745 4,524,662
762 4,524,663
840 4,524,664

CLASS 84

1.01 4,524,665
1.03 4,524,666
1.15 4,524,667
1.24 4,524,668
433 4,524,669

CLASS 89

1.53 4,524,670
14.05 4,524,671
33.02 4,524,673
33.1 4,524,672
36 H 4,524,674
41.03 4,524,675

CLASS 91

43 4,524,676

CLASS 92

168 4,524,677

CLASS 98

1 4,524,678
40.02 4,524,679

CLASS 99

277.1 4,524,680
474 4,524,681
477 4,524,682

CLASS 100

3 4,524,683
117 4,524,684
210 4,524,685

CLASS 101

111 4,524,686
123 4,524,687
4,524,688
141 4,524,689
148 4,524,690
232 4,524,691
350 4,524,692

CLASS 102

393 4,524,694
430 4,524,695
491 4,524,696
517 4,524,697

CLASS 104

107 4,524,698

CLASS 105

4 R 4,524,699
377 4,524,700

CLASS 106

2 4,525,213
19 4,525,214
22 4,525,215
30 4,525,216
35 4,524,824
304 4,525,217

CLASS 108

44 4,524,701

CLASS 110

173 A 4,524,702

CLASS 112

098 4,524,703
105 4,524,704
121.15 4,524,705
121.29 4,524,706
152 4,524,707
231 4,524,708

CLASS 114

39 4,524,709
215 4,524,711
275 4,524,710

CLASS 118

46 4,524,712
102 4,524,713
123 4,524,714
221 4,524,715
665 4,524,716
718 4,524,717
4,524,718
719 4,524,719

CLASS 119

14.14 4,524,720
17 4,524,721
21 4,524,722
45 R 4,524,723
72.5 4,524,724

CLASS 122

7 R 4,524,725
13 R 4,524,726
235 A 4,524,727
459 4,524,728
498 4,524,729

CLASS 123

27 GE 4,524,730
90.57 4,524,731
193 H 4,524,732
196 A 4,524,733
196 R 4,524,735
196 S 4,524,734
198 D 4,524,736
300 4,524,737
339 4,524,738
4,524,739
340 4,524,740
342 4,524,741
438 4,524,742
4,524,743
459 4,524,744
478 4,524,745
538 4,524,746
557 4,524,747
591 4,524,748

CLASS 124

7 4,524,749
23 R 4,524,750

CLASS 126

25 A 4,524,751
91 A 4,524,752
99 R 4,524,753
110 R 4,524,754
247 4,524,755
400 4,524,756
426 4,524,757
440 4,524,758
452 4,524,759

CLASS 127

37 4,525,218

CLASS 128

1 R 4,524,760
6 4,524,761
33 4,524,762
75 4,524,763
80 C 4,524,764
92 D 4,524,765
92 H 4,524,766
132 D 4,524,767
134 4,524,768
203.15 4,524,769
303.1 4,524,770
339 4,524,771
355 4,524,772
419 S 4,524,773
421 4,524,774
640 4,524,775
644 4,524,776
677 4,524,777
736 4,524,778
4,524,779

CLASS 130

30 G 4,524,780

CLASS 131

108 4,524,781
180 4,524,782
276 4,524,783
281 4,524,784
4,524,785
308 4,524,786

CLASS 132

7 4,524,787
42 R 4,524,788
73 4,524,789
84 R 4,524,790

CLASS 134

1 4,525,219
21 4,525,220

CLASS 135

89 4,524,791
90 4,524,792

CLASS 136

255 4,525,593
256 4,525,594

CLASS 137

198 4,524,793
202 4,524,794
216.2 4,524,795
240 4,524,796
343 4,524,797
448 4,524,798
516.27 4,524,799
4,524,800
567 4,524,801
595 4,524,802
625.64 4,524,803
4,524,804
846 4,524,805
856 4,524,806
884 4,524,807

CLASS 138

103 4,524,808

CLASS 141

1 4,524,809
250 4,524,810
325 4,524,811

CLASS 144

134 A 4,524,812

CLASS 148

1.5 4,525,221
121 4,525,222
171 4,525,223
189 4,525,224

CLASS 149

19.5 4,525,225
35 4,525,226

CLASS 156

62.2 4,525,227
155 4,525,228
161 4,525,229
179 4,525,230
185 4,525,231
273.3 4,525,232
273.9 4,525,233
332 4,525,234
511 4,525,235
517 4,525,236
540 4,525,237
645 4,525,238
4,525,239
659.1 4,525,240

CLASS 157

1.17 4,524,813

CLASS 160

133 4,524,814

CLASS 162

301 4,525,241
358 Re.31,923

CLASS 163

5 4,524,815

CLASS 164

287 4,524,816
290 4,524,817
448 4,524,818
468 4,524,819
476 4,524,820
482 4,524,821

CLASS 165

141 4,524,822
174 4,524,823

CLASS 166

139 4,524,825
248 4,524,826
4,524,827
293 4,524,828
294 4,524,829
321 4,524,830
322 4,524,831
347 4,524,832
381 4,524,833
385 4,524,834

CLASS 169

65 4,524,835

CLASS 172

4.5 4,524,836
156 4,524,837

CLASS 174

35 GC 4,525,595
42 4,525,596
52 FP 4,525,597
128 R 4,525,598

CLASS 175

297 4,524,838

CLASS 177

45 4,524,839
210 C 4,524,840

CLASS 178

22.08 4,525,599

CLASS 179

6.02 4,525,600
7 MM 4,525,601
16 F 4,525,602
84 R 4,525,603
115.5 H 4,525,604
175.2 R 4,525,605

CLASS 180

132 4,524,842
179 4,524,843
219 4,524,844

CLASS 181

152 4,524,845
4,524,846

CLASS 182

23 4,524,847
77 4,524,848
170 4,524,849

CLASS 188

71.8 4,524,850
134 4,524,851

CLASS 190

16 4,524,852

CLASS 192

18 R 4,524,853
84 C 4,524,854
88 A 4,524,855
98 4,524,856

CLASS 198

409 4,524,857
434 4,524,858
735 4,524,859
740 4,524,860
781 4,524,861
4,524,862
797 4,524,863
828 4,524,864
852 4,524,865

CLASS 200

5 A 4,525,606
16 R 4,525,607
38 R 4,525,608
4,525,609
51.13 4,525,610
83 R 4,525,611
147 R 4,525,612
159 R 4,525,613

CLASS 202

177 4,525,242
181 4,525,243

CLASS 203

26 4,525,244
51 4,525,245

CLASS 204

15 4,525,246
24 4,525,247
29 4,525,248
58.5 4,525,250
79 4,525,251
101 4,525,252
129.75 4,525,249
149 4,525,253
150 4,525,254
158 R 4,525,255
159.18 4,525,256
159.2 4,525,257
159.23 4,525,258
181.7 4,525,260
182.4 4,525,259
192 EC 4,525,261
192 R 4,525,262
196 4,525,263
298 4,525,264
403 4,525,265
412 4,525,266

CLASS 206

223 4,524,866
232 4,524,867
233 4,524,871
358 4,524,869
364 4,524,868
608 4,524,870

CLASS 208

58 4,525,267
73 4,525,268
309 4,525,269

CLASS 209

44 4,525,270
303 4,525,271

CLASS 210

149 4,525,272
164 4,525,273
232 4,525,274
323.2 4,525,275
433.2 4,525,276
601 4,525,277
610 Re.31,924
638 4,525,278
728 4,525,279
4,525,280
735 4,525,281
747 4,525,282
762 4,525,283
777 4,525,284

CLASS 211

4 4,524,872

CLASS 212

177 4,524,873
197 4,524,874
239 4,524,875

CLASS 215

224 4,524,876
228 4,524,877

CLASS 219

10.55 D 4,525,614
10.55 M 4,525,615
60 R 4,525,616
83 4,525,617
89 4,525,618
124.22 4,525,619
137 PS 4,525,621
137 WM 4,525,620
270 4,525,622
373 4,525,623

CLASS 220

224 4,524,878
273 4,524,879
288 4,524,880
306 4,524,882
374 4,524,881
462 4,524,883

CLASS 221

231 4,524,884

CLASS 222

5 4,524,885
58 4,524,886
146.5 4,524,887
153 4,524,888

CLASS 223

76 4,524,889
94 4,524,890
109 R 4,524,891

CLASS 224

256 4,524,892
319 4,524,893

CLASS 225

2 4,524,894
19 4,524,895

CLASS 227

126 4,524,896
131 4,524,897

CLASS 228

1.1 4,524,898
173.2 4,524,899

CLASS 229

19 4,524,900
4,524,901
52 A 4,524,902
73 4,524,903

CLASS 232

7 4,524,904
35 4,524,905

CLASS 235

383 4,525,624

CLASS 236

12.11 4,524,906
34.5 4,524,907
46 R 4,524,908

CLASS 237

2 B 4,524,909
81 4,524,910

CLASS 239

101 4,524,911
150 4,524,912
222.17 4,524,913
452 4,524,914

CLASS 241

39 4,524,915
101 A 4,524,916
101.2 4,524,917

CLASS 242

18 A 4,524,918
67.1 R 4,524,919
71.1 4,524,920
84.1 J 4,524,921
84.1 R 4,524,922
84.5 A 4,524,923
107.4 A 4,524,924
197 4,524,925
198 4,524,926
4,524,927
212 Re.31,920

CLASS 244

35 R 4,524,928
63 4,524,929
152 4,524,930

CLASS 246

167 D 4,524,931
247 4,524,932

CLASS 248

27.3 4,524,933
62 4,524,934
4,524,935
4,524,936
74.3 4,524,937
110 4,524,938
359 4,524,940
467 4,524,939
544 4,524,941
643 4,524,942

CLASS 249

63 4,524,943

CLASS 250

201 4,525,625
227 4,525,626
345 4,525,627
367 4,525,628
396 ML 4,525,629
572 4,525,630

CLASS 251

6 4,524,944
75 4,524,945
88 4,524,946
129 4,524,947
139 4,524,948
163 4,524,949
326 4,524,950
327 4,524,951

CLASS 252

8.5 M 4,525,285
21 4,525,286
26 4,525,287
32.7 E 4,525,288
49.9 4,525,289
73 4,525,290
95 4,525,291
102 4,525,292
181 4,525,293
182 4,525,294
301.36 4,525,295
391 4,525,296
511 4,525,297
522 R 4,525,298

CLASS 254

269 4,524,952

CLASS 256

23 4,524,953

CLASS 260

112.5 R 4,525,299
4,525,300
4,525,301
239.3 R 4,525,302
239.55 R 4,525,303
245.4 4,525,304
401 4,525,305
428.5 4,525,306
453 RZ 4,525,308
462 C 4,525,309
465.6 4,525,310
940 4,525,311

CLASS 264

1.5 4,525,312
3 B 4,525,313
9 4,525,314
40.4 4,525,315
54 4,525,316
235.8 4,525,317
259 4,525,318
280 Re.31,925
322 4,525,319
502 4,525,320
517 4,525,321
531 4,525,322

CLASS 266

45 4,524,954
49 4,524,955
236 4,524,956
252 4,524,957
272 4,524,958

CLASS 269

43 4,524,959
45 4,524,960

CLASS 270

4 4,524,961
21.1 4,524,962

CLASS 271

3.1 4,524,963
204 4,524,964
214 4,524,965

CLASS 272

85 4,524,966

CLASS 273

1 GE 4,524,967
2 4,524,968
3 R 4,524,969
153 S 4,524,971
158 4,524,972
183 D 4,524,973
207 4,524,974
247 4,524,975
388 4,524,976

CLASS 277

3 4,524,977
189 4,524,978
199 4,524,979
4,524,980
210 4,524,981
229 4,524,982

CLASS 279

110 4,524,983

CLASS 280

18 4,524,984
33.99 C 4,524,985
81 A 4,524,841
154.5 R 4,524,986
204 4,524,987
208 4,524,988
281 R 4,524,989
633 4,524,990

CLASS 281

20 4,524,991
45 4,524,992
46 4,524,993

CLASS 285

38 4,524,994
54 4,524,995
55 4,524,996
74 4,524,997
101 4,524,998
158 4,524,999
177 4,525,000
328 4,525,001

CLASS 289

2 4,525,002
17 4,525,003

CLASS 290

4 R 4,525,631
38 R 4,525,632
44 4,525,633

CLASS 292

171 4,525,004

CLASS 293

117 4,525,005

CLASS 294

19.1 4,525,006
74 4,525,007
99.2 4,524,647
4,524,648

CLASS 296

97 K 4,525,008

CLASS 297

118 4,525,009
216 4,525,010

CLASS 303

19 4,525,011

CLASS 307

115 4,525,634
247 R 4,525,635
264 4,525,636
350 4,525,637
4,525,638
446 4,525,639
450 4,525,640
465 4,525,641

CLASS 310

260 4,525,642
313 A 4,525,643
328 4,525,644
337 4,525,645
360 4,525,646
361 4,525,647

CLASS 312

222 4,525,012

CLASS 313

631 Re.31,928

CLASS 315

96 4,525,649
224 4,525,648
226 4,525,650
240 4,525,651
307 4,525,652
366 4,525,653

CLASS 318

7 4,525,654
45 4,525,655
85 4,525,656
254 4,525,657
317 4,525,658
649 4,525,659
798 4,525,660

CLASS 322

4 4,525,661
28 4,525,662

CLASS 323

280 4,525,663

CLASS 324

51 4,525,664
52 4,525,665
71.1 4,525,666
140 R 4,525,667
142 4,525,668
4,525,669
208 4,525,670
252 4,525,671
304 4,525,672
312 4,525,673

CLASS 328

63 4,525,674
140 4,525,675

CLASS 329

50 4,525,676

CLASS 330

258 4,525,677
277 4,525,678
4,525,679
4,525,680
286 4,525,681
288 4,525,682
4,525,683
304 4,525,684

CLASS 331

10 4,525,685
17 4,525,686

CLASS 332

7.51 4,525,687

CLASS 333

81 R 4,525,688
104 4,525,689
116 4,525,690
139 4,525,691
142 4,525,692
236 4,525,693

CLASS 335

132 4,525,694
262 4,525,695
272 4,525,696

CLASS 337

354 4,525,697

CLASS 338

39 4,525,698

CLASS 339

7 4,525,013
14 R 4,525,014
17 C 4,525,015
75 R 4,525,016
89 M 4,525,017
91 R 4,525,018
98 4,525,019
99 R 4,525,020
104 4,525,021
220 C 4,525,022
258 R 4,525,023

CLASS 340

512 4,525,699
518 4,525,700
541 4,525,701
556 4,525,702
628 4,525,703
632 4,525,704
677 4,525,705
679 4,525,706
707 4,525,707
713 4,525,708
719 4,525,709
784 4,525,710
815.31 4,525,711
825.31 4,525,712
825.54 4,525,713
825.83 4,525,714
854 4,525,715

CLASS 343

381 4,525,716
452 4,525,717
702 4,525,718
761 4,525,719
895 4,525,720

CLASS 346

1.1 4,525,721
4,525,722
74.4 4,525,723
74.5 4,525,724
4,525,725
75 4,525,726
140 R 4,525,727
4,525,728
154 4,525,729

CLASS 350

6.5 4,525,024
96.15 4,525,025
96.23 4,525,026
96.30 4,525,027
128 4,525,029
255 4,525,030
265 4,525,031
331 R 4,525,032
350 R 4,525,033
377 4,525,028
395 4,525,034
410 4,525,035
427 4,525,036
450 4,525,037
462 4,525,038
465 4,525,039
480 4,525,040
484 4,525,041
519 4,525,042

CLASS 351

160 H 4,525,044
160 R 4,525,043

CLASS 352

57 4,525,045

CLASS 354

149.11 4,525,046
173 4,525,047
173.1 4,525,048
173.11 4,525,049
195.12 4,525,050
203 4,525,051
293 4,525,052
400 4,525,053
443 4,525,054
468 4,525,055

CLASS 355

3 DD 4,525,056
3 FU 4,525,057
4,525,058
8 4,525,059
53 4,525,060
72 4,525,061
4,525,062
4,525,063
75 4,525,064
77 4,525,065

CLASS 356

35.5 4,525,068
43 4,525,066
346 4,525,067
435 4,525,069

CLASS 357

5 4,525,730
12 4,525,731
13 4,525,732
65 4,525,733
67 4,525,734

CLASS 358

10 4,525,735
28 4,525,736
44 4,525,737
181 4,525,738
190 4,525,739
192.1 4,525,740
212 4,525,741
213 4,525,742
4,525,743
224 4,525,744
237 4,525,745
254 4,525,746
284 4,525,747
286 4,525,748
290 4,525,749
327 4,525,750
342 4,525,751

CLASS 360

13 4,525,752
45 4,525,753
51 4,525,754
63 4,525,755
75 4,525,756
130.24 4,525,757
133 4,525,758
135 4,525,759
137 4,525,760
4,525,761

CLASS 361

13 4,525,762
24 4,525,763
42 4,525,764
88 4,525,765
283 4,525,766
321 4,525,767
4,525,768
386 4,525,769
393 Re.31,929
399 4,525,770
413 4,525,771

CLASS 362

290 4,525,772
413 4,525,773

CLASS 363

17 4,525,774

CLASS 364

148 4,525,775
200 4,525,776
4,525,777
4,525,778
4,525,779
4,525,780
431.01 4,525,781
4,525,782
431.11 4,525,783
434 4,525,784
464 4,525,785
466 4,525,786
470 4,525,787
478 4,525,788
481 4,525,789
484 4,525,790
508 4,525,791
509 4,525,792
513.5 4,525,793
567 4,525,794
721 4,525,795
730 4,525,796
788 4,525,797
826 4,525,798
900 4,525,799
4,525,800
4,525,801
4,525,802
4,525,803
4,525,804
4,525,805
4,525,806

CLASS 365

36 4,525,807
4,525,808
51 4,525,809
102 4,525,810
154 4,525,811
155 4,525,812

CLASS 366

18 4,525,070
152 4,525,071
168 4,525,072
323 4,525,073

CLASS 367

20 4,525,813
4,525,814
35 4,525,815
123 4,525,816
140 4,525,817
149 4,525,818
167 4,524,693
188 4,525,819

CLASS 368

10 4,525,074
4,525,075
63 4,525,076
77 4,525,077
134 4,525,078
276 4,525,079

CLASS 369

2 4,525,820
31 4,525,821
44 4,525,822
4,525,823
45 4,525,824
4,525,825
46 4,525,826
72 4,525,827
111 4,525,828
284 4,525,829

CLASS 370

3 4,525,834
29 4,525,835
60 4,525,830
63 4,525,831
67 4,525,836
85 4,525,832
4,525,837
99 4,525,833

CLASS 371

37 4,525,838
38 4,525,839
47 4,525,840

CLASS 372

48 4,525,841
92 4,525,842
94 4,525,843

CLASS 374

115 4,525,080
208 4,525,081

CLASS 375

2.1 4,525,844
36 4,525,845
39 4,525,846
59 4,525,847
87 4,525,848
118 4,525,849

CLASS 376

106 4,525,323
272 4,525,324

CLASS 377

19 4,525,850
110 4,525,851

CLASS 378

34 4,525,852
84 4,525,853
089 4,525,854

CLASS 381

22 4,525,855
93 4,525,856
100 4,525,857

CLASS 382

1 4,525,858
5 4,525,859
21 4,525,860

CLASS 384

138 4,525,082
278 4,525,083

CLASS 400

55 4,525,084
59 4,525,085
144.2 4,525,086
613.2 4,525,087
621 4,525,088
639.1 4,525,089

CLASS 401

127 4,525,090
134 4,525,091
265 4,525,092

CLASS 403

4 4,525,093
11 4,525,094
16 4,525,095
49 4,525,096
259 4,525,097
280 4,525,098
371 4,525,099

CLASS 405

129 4,525,100
169 4,525,101
232 4,525,102
261 4,525,103
290 4,525,104

CLASS 406

25 4,525,107
50 4,525,105
60 4,525,106

CLASS 407

22 4,525,108
36 4,525,109
40 4,525,110

CLASS 408

239 A 4,525,111

CLASS 409

199 4,525,112

CLASS 410

41 4,525,113

CLASS 411

9 4,525,114
457 4,525,115

CLASS 412

8 4,525,116
39 4,525,117

CLASS 414

43 4,525,118
82 Re.31,921
111 4,525,119
160 4,525,120
564 4,525,121

CLASS 416

80 4,525,122
115 4,525,123
132 B 4,525,124

CLASS 417

44 4,525,125
310 4,525,126
479 4,525,127
550 4,525,128

CLASS 418

84 4,525,129

CLASS 420

473 4,525,325
535 4,525,326
565 4,525,327

CLASS 422

80 4,525,328
202 4,525,329

CLASS 423

24 4,525,330
54 4,525,331
89 4,525,332
112 4,525,333
235 4,525,142
324 4,525,334
344 4,525,335
348 4,525,336
449 4,525,337
573 G 4,525,338

CLASS 424

16 4,525,339
4,525,340
22 4,525,345
43 4,525,341
49 4,525,342
54 4,525,342
73 4,525,344
80 4,525,346
81 4,525,347
4,525,348
89 4,525,349
94 4,525,350
95 4,525,351
114 4,525,352
4,525,353
115 4,525,354

CLASS 425

2 4,525,130
114 4,525,131
117 4,525,132
120 4,525,133
130 4,525,134
290 4,525,135
384 4,525,136

CLASS 426

3 4,525,363
4,525,364
101 4,525,365
271 4,525,366
394 4,525,367
438 4,525,368
446 4,525,369
508 4,525,370
557 4,525,371
564 4,525,372
634 4,525,373

CLASS 427

2 4,525,374
8 4,525,375
10 4,525,376
12 4,525,377
38 4,525,378
53.1 4,525,379
4,525,380
54.1 4,525,381
4,525,382
89 4,525,383
174 4,525,384
177 4,525,385
185 4,525,386
190 4,525,387
221 4,525,388
255.1 4,525,389
305 4,525,390
391 4,525,391
420 4,525,392

CLASS 428

7 4,525,393
26 4,525,394
35 4,525,395
4,525,396
36 4,525,397
40 4,525,398
43 4,525,399
54 4,525,400
64 4,525,401
4,525,402
87 4,525,403
92 4,525,404
95 4,525,405
137 4,525,406
138 4,525,407
159 4,525,408
193 4,525,409
198 4,525,410
4,525,411
199 4,525,412
212 4,525,413
213 4,525,414
216 4,525,415
220 4,525,416
244 4,525,417
264 4,525,418
336 4,525,419
372 4,525,420
412 4,525,421
418 4,525,422
421 4,525,423
425.9 4,525,424
428 4,525,425
447 4,525,426
458 4,525,427
488.1 4,525,428
566 4,525,429
625 4,525,430
638 4,525,431
653 4,525,432
670 4,525,433
674 4,525,434

CLASS 429

111 4,525,435
4,525,436
4,525,437
149 4,525,438
162 4,525,439
191 4,525,440

CLASS 430

46 4,525,441
57 4,525,442
83 4,525,443
96 4,525,444
109 4,525,445
117 4,525,446
122 4,525,447
314 4,525,448
407 4,525,449
551 4,525,451
552 4,525,450

CLASS 431

76 4,525,137
187 4,525,138
189 4,525,139
258 4,525,140
347 4,525,141

CLASS 433

5 4,525,143
118 4,525,144
173 4,525,145
198 4,525,146
224 4,525,147

CLASS 434

340 4,525,148

CLASS 435

7 4,525,452
3/ 4,525,453
106 4,525,454
135 4,525,455
176 4,525,456
178 4,525,457
196 4,525,458

CLASS 436

544 4,525,459

CLASS 440

1 4,525,149

CLASS 455

33 4,525,861
47 4,525,862
83 4,525,863
160 4,525,864
186 4,525,865
4,525,866
4,525,867
194 4,525,868
206 4,525,869
277 4,525,870
297 4,525,871
325 4,525,872
344 4,525,873
600 4,525,874

CLASS 474

93 4,525,150
101 4,525,151
133 4,525,152
138 4,525,153
167 4,525,158
201 4,525,159
242 4,525,160

CLASS 493

42 4,525,161
154 4,525,154

CLASS 494

3 4,525,155

CLASS 501

71 4,525,462
86 4,525,460
90 4,525,461
99 4,525,463
103 4,525,464

CLASS 502

7 4,525,465
63 4,525,466
104 4,525,468
121 4,525,467
125 4,525,469
167 4,525,470
209 4,525,471
323 4,525,472

CLASS 514

157 Re.31,926
202 4,525,473
210 4,525,355
226 4,525,474
234 4,525,356
255 4,525,358
258 4,525,357
277 4,525,360
304 4,525,475
326 4,525,476
333 4,525,477
350 4,525,478
469 4,525,479
521 Re.31,927
544 4,525,480
653 4,525,359
689 4,525,361
712 4,525,362
788 4,525,199

CLASS 518

700 4,525,481
707 4,525,482

CLASS 521

28 4,525,483
56 4,525,484
58 4,525,485
59 4,525,486
78 4,525,487
108 4,525,489
124 4,525,490
164 4,525,488
174 4,525,491
181 4,525,492

CLASS 523

116 4,525,493
200 4,525,494
205 4,525,495
337 4,525,496
400 4,525,497
511 4,525,498
523 4,525,499

CLASS 524

5 4,525,500
28 4,525,501
96 4,525,502
98 4,525,503
99 4,525,504
100 4,525,505
102 4,525,506
104 4,525,507
140 4,525,508
141 4,525,509
156 4,525,510
158 4,525,511
284 4,525,512
288 4,525,513
291 4,525,514
378 4,525,515
380 4,525,516
394 4,525,517
447 4,525,518
457 4,525,519
512 4,525,520
517 4,525,521
547 4,525,522
572 4,525,523
601 4,525,524
742 4,525,525
815 4,525,526
831 4,525,527
860 4,525,528

CLASS 525

64 4,525,529
84 4,525,530
92 4,525,531
98 4,525,532
4,525,533
127 4,525,534
163 4,525,535
194 4,525,536

CLASSIFICATION OF PATENTS

198 4,525,537
275 4,525,538
326.3 4,525,539
327.2 4,525,540
337 4,525,541
484 4,525,542
529 4,525,543
531 4,525,544

CLASS 526

65 4,525,545
68 4,525,546
4,525,547
72 4,525,548
92 4,525,549

116 4,525,550
4,525,551
4,525,552
120 4,525,553
124 4,525,554
125 4,525,555
4,525,556
128 4,525,557
142 4,525,558
200 4,525,559
201 4,525,560
220 4,525,561
271 4,525,562
279 4,525,563

348.1 4,525,564

CLASS 528

17 4,525,565
4,525,566
27 4,525,567
60 4,525,568
73 4,525,569
75 4,525,570
111 4,525,571
170 4,525,572
232 4,525,573
283 4,525,574
301 4,525,575
313 4,525,576

327 4,525,577
354 4,525,578
388 4,525,579
490 4,525,580
503 4,525,581

CLASS 534

558 4,525,582
606 4,525,583

CLASS 536

24 4,525,584
98 4,525,585

CLASS 544

89 4,525,588
025 4,525,587
128 4,525,589
174 4,525,586
222 4,525,590
250 4,525,591

CLASS 556

182 4,525,307

CLASS 564

307 4,525,592

CLASS 603

3 4,524,466
6 4,524,468
22 4,524,467

CLASS 604

28 4,525,156
52 4,525,157
56 4,525,162
65 4,525,163
131 4,525,164
4,525,165
133 4,525,166
135 4,525,167
385 A Re.31,922

CLASSIFICATION OF DESIGNS

D2— 282 279,325
298 279,326
310 279,327
D3— 35 279,328
40 279,329
76 279,330
D6— 335 279,333
354 279,334
361 279,335
368 279,336
371 279,337
376 279,338
379 279,331
279,332
384 279,339
429 279,340

466 279,341
279,342
522 279,343
596 279,344
D7— 28 279,345
77 279,346
D8— 1 279,347
11 279,348
13 279,349
71 279,350
331 279,351
354 279,352
D9— 349 279,353
351 279,354
432 279,355
434 279,356

450 279,357
D10— 71 279,358
126 279,359
D11— 71 279,360
D12— 9 279,361
133 279,362
143 279,363
146 279,364
147 279,365
279,366
149 279,367
157 279,368
158 279,369
159 279,370
D14— 16 279,371
52 279,372

53 279,373
100 279,374
113 279,375
D15— 5 279,376
7 279,377
138 279,378
279,379
D17— 20 279,380
D18— 2 279,381
4 279,382
D19— 51 279,383
75 279,384
77 279,385
91 279,386
279,387
279,388

D20— 39 279,389
D21— 52 279,390
279,391
279,392
59 279,393
86 279,394
92 279,395
201 279,396
212 279,397
279,398
221 279,399
232 279,400
245 279,401
D23— 2 279,402
28 279,403
62 279,404

D24— 23 279,405
36 279,406
53 279,407
D25— 25 279,408
74 279,409
D26— 69 279,410
D28— 53 279,411
58 279,412
D30— 11 279,413
43 279,414
D32— 49 279,415
69 279,416
D34— 1 279,417
38 279,418
D99— 29 279,419

CLASSIFICATION OF PLANTS

P.— 68 5,501
70 5,499
73 5,498
5,500
76 5,502

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,524,505
4,524,527
4,524,606
4,524,681
4,524,837
4,524,966
4,525,850
04 : 4,524,481
4,524,535
4,524,630
4,524,731
4,524,886
4,525,043
4,525,144
4,525,247
4,525,272
4,525,287
4,525,341
4,525,424
4,525,638
4,525,663
4,525,675
4,525,714
4,525,777
05 : 4,524,573
06 : Re.31,922
Re.31,924
Re.31,929
4,524,471
4,524,509
4,524,517
4,524,526
4,524,552
4,524,553
4,524,601
4,524,604
4,524,616
4,524,619
4,524,620
4,524,623
4,524,647
4,524,650
4,524,662
4,524,667
4,524,673
4,524,711
4,524,719
4,524,722
4,524,736
4,524,746
4,524,757
4,524,759
4,524,766

4,524,776
4,524,782
4,524,791
4,524,794
4,524,805
4,524,813
4,524,834
4,524,838
4,524,846
4,524,869
4,524,893
4,524,906
4,524,925
4,524,930
4,524,940
4,524,962
4,524,964
4,524,975
4,524,976
4,524,983
4,524,984
4,524,985
4,524,992
4,525,045
4,525,090
4,525,096
4,525,099
4,525,133
4,525,143
4,525,156
4,525,162
4,525,174
4,525,184
4,525,199
4,525,201
4,525,202
4,525,203
4,525,205
4,525,226
4,525,239
4,525,252
4,525,270
4,525,273
4,525,311
4,525,323
4,525,359
4,525,398
4,525,399
4,525,531
4,525,603
4,525,605
4,525,613
4,525,641

4,525,644
4,525,672
4,525,673
4,525,677
4,525,689
4,525,695
4,525,720
4,525,754
4,525,766
4,525,802
4,525,815
4,525,836
4,525,838
4,525,852
4,525,857
08 : 4,524,608
4,525,064
4,525,067
4,525,263
4,525,345
4,525,425
09 : 4,524,467
4,524,518
4,524,545
4,524,557
4,524,593
4,524,599
4,524,617
4,524,624
4,524,679
4,524,820
4,524,835
4,524,872
4,524,874
4,524,877
4,524,894
4,524,963
4,524,965
4,524,980
4,525,000
4,525,013
4,525,015
4,525,019
4,525,044
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